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**REVIEWING APPLICATION OF THE PROJECT MANAGEMENT OFFICE IN  
CONSTRUCTION SECTOR****Faiq M. S. Al-Zwainy \***, Alaa M. Shalal, Ibraheem A. Mohammed

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**ABSTRACT**

PMOs can help project managers by providing the structure needed to both standardize project management practices and facilitate construction project portfolio management, as well as determine methodologies for repeatable processes. The aim of this research is to Examining and analyzing the previous studies related to the types of the PMO, its (roles and functions) and Project Management (PM) to find potential areas for a deeper research. One of the most important results of this study are PMO adds value to an organization. Each organization, according to its mission and vision, chooses the different PMO type and assigns it different roles and responsibilities. Thus, now the PMO is considered as the focal point of project and PM related practices.

**KEYWORDS:** project management office, comparison PMP, PMO**INTRODUCTION**

In the decades 1960 and 1970, the functions project management has been many changes and still projects an increasing role of planning and control at the time and cost. In the last decade, these products took to create a separate unit for managing projects in organizations to get to the level of growth. This organizational unit called as the project management office (**Dai and San, 2002**).

Project management offices, or PMOs, are becoming increasingly popular among contracting companies seeking to improve how they delegate, organize, control and monitoring, also oversee projects. PMOs can play a variety of roles within contracting companies, some of the PMI is created to manage special, but most of PMO can be applied for projects from start to completion, while others provide administrative assistance to project managers so they can focus on more critical tasks.

**RESEARCH OBJECTIVE**

The main aim of this chapter is to introduce Project management Office (PMO) and assessment the applying some of the types of the PMO in the construction sector. This aim is to be justified through the following procedure:

- 1) Exploring the applications of Project management Office (PMO) in the construction management field.
- 2) To examine and comparison between past studies and exploring the strong and weak points for each study.
- 3) A comparison between the latest study in 2016 and previous studies, and discover points of differences and similarities, and the statement of the addition and renovation of the current study in the project management field

**RESEARCH IMPORTANCE**

The Significance of this chapter can be divided into two main parts. Firstly, this study can be provided immense value to the success of construction project by using PMO. Secondly, the findings of this research could provide for academic researchers a source of reference.

**EXPLORING THE APPLICATIONS OF PROJECT MANAGEMENT OFFICE (PMO) IN THE CONSTRUCTION MANAGEMENT FIELD**

There are a lot of studies and research that reviewed it and benefited by the researcher in the study provided. It can mention some of these studies as follows:

1. A master thesis of science in technology management of the National University of Ireland, Galway (2009), by Derek Keating, PMP, was titled: **(How does the Project Management Office (PMO) deliver value to the organization?)**

The primary research question of this study was to identify how PMOs deliver value to their organizations. This research has been carried out to advance the existing body of knowledge in this field, specifically in relation to what functions the PMO performs in delivering value to the organization. Using knowledge gleaned from the existing body of research in this field, the author has created the PMO Value Framework, a theoretical framework used to describe the functions or roles performed by PMOs. The author's hypothesis is that it is through performing these roles that the PMO delivers value to the organization and as the PMO's ability to perform these roles improves the value delivered will increase. This research shows that where PMOs exist, by performing the roles and functions described in the PMO Value Framework they are contributing to increasing project management maturity levels within their organization.

2. A master thesis of science of project management (2010) by Michaela Symeonidi, was titled: **(The PMO as an innovative tool for the Public Electricity Organization)**

Symeonidi elaborated in the frame of the collaboration of the City University of Seattle and the Graduate Technological Education Institute (T.E.I.). This thesis studied the Public Electricity Organization, which was the only electricity organization in Greece and incurred to a lot of loses recently because of its inability to undertake and adequate control many projects in parallel and of the creation of a competitive company, and proposed a solution which will increase the organization's profits and enhance its strength. Symeonidi proposed the most appropriate solution for this organization is the establishment of a PMO (the mission, the objectives, the responsibilities and the location of the PMO). Moreover, this thesis outlined the critical success factors and the work breakdown structure of this project and will be of much help for the organization and can be used by the organization for future evaluation of the PMO.

3. A master in project management program (2010) by Sundis PH. Al Rawi for The British University in Dubai, was titled: **(Implementation of PMO in Middle East)**

Al Rawi examined the relationship between traditional Western project management theories and the present business environment found in the industrialized Middle East. The local culture was also taken into consideration and local practices were also studied in this research. The challenges faced by PMO were highlighted and recorded and at the end recommendations are suggested to improve the overall environment in PMO's of Middle East. It is hoped that this research shall go a long way to help project managers setup PMOs in the Middle East and achieve the required maturity to handle massive projects coming up in the future.

4. Ph.D., dissertation of Management in Organizational Leadership (2010) by Lore Sprouse for University of Phoenix, was titled: **(The Influence of the efficacy of the program management office on IT project success rates)**.

Sprouse indicated that the efficacy of the PMO had no influences on the IT project success rate. From this study, three themes emerged: (a) The efficacy of the PMO was achieved, (b) no connection exists between the PMO and the IT project success rate, and (c) PMO personnel and Project managers have adequate and sufficient leadership skills. The interpretations and conclusions will be shared with organizational leaders in order to optimize the institutionalization of the PMO into the organizational infrastructure and leverage the efficacy toward the successfulness of project managers to increase the IT project success rate and the organizational performance.

5. A master thesis of science of project management (2011) by Hizamul-din bin Ab Rahman, (University Technology Malaysia), was titled: **(Establishing a Project Management Office for a more Effective and Efficient implementation of Projects in JKR)**

Ab Rahman determined the present JKR (Jabatan Kerja Raya Malaysia Company) project management practice in order to propose an improvement to those existing practices by developing a PMO model, which is one of the strategies for this on-going improvement journey. This model is developed to suit the local requirements and environment, but comparable to the international established best practices. The proposed PMO is able facilitates JKR to implement projects more effective and efficient.

**6. A Master of Science Thesis in the Master's programmed International Project Management, 2011, by Ekaterina Gorshkova, Chalmers University of Technology, Sweden, was titled: (Improving project management capability with assistance of PMO in a technology company)**

Gorshkova investigated if and how can PMO bring and sustain value, highlighting the specifics of the engineering customer services companies. The sub-questions of the research considered the reasons for PMO establishment, and its optimal implementation and responsibilities.

The main ideas drawn from the investigation are assigning different responsibilities and level of authority over different types of projects (and the need for their categorization), location of PMOs in the organizational units understanding a need for it, and keeping technology-oriented project managers within their home organizational units.

The success factors of the PMO are addressing specific needs of the company, clear definition and communication of PMO goals, purpose, role, authority, and responsibilities, gradual development, strong leadership, competent personnel experienced in project management, support of the senior management, and ability to demonstrate value.

**7. A Master Thesis Report written in collaboration with the Department of Industrial Information and Control Systems Royal Institute of Technology, Stockholm, Sweden, 2011 by David Lindblom and Henrik Eberhard, was titled: (A Perspective on prioritization in project portfolio environment)**

The overriding aspect of this interpretative master thesis is the implementation of a project prioritizing strategy. The concept is subdivided into three processes and entities, which could be seen as tools; project management office (PMO), project evaluation and project selection, which in turn are discussed separately. The thesis investigates how the tools impact the prioritizing strategy and why a company must follow a certain prioritizing strategy.

At the moment the PMO should not directly be involved in the prioritizing stage at the industrial company, but rather indirectly. The PMO would ensure that all project managers update the database in a formalized way it would be possible for the portfolio manager and the governance team to make better and more profound decisions. This would result in an easier way of prioritizing between projects.

**8. A research that titled "How to establish a Project Management Office (PMO)" by Rania Al-Maghraby, PMP, ITIL, MSc. 2011.**

Al-Maghraby presented the importance of a PMO in an organization, its intended role. This study summarizes the sequence of broad line steps that are followed in order to set up the PMO. Details the activities carried out in order to accomplish each step of this process.

**9. A master thesis of business administration (MBA) at Liverpool John Moore's University in conjunction with Dublin Business School (2012) by Krishna Govind Purohit, was titled: (What is the Influence of Project Management Office in Regard to Client Expectation in IT Industry, Ireland?)**

The primary objective of this study was to understand the role of the PMO and examine its impact and methodologies on project performance. The adoption of the project management methodology and practices among IT companies has proven to be very popular with the advancement of IT in one's life. Although this study is based on IT industry apart from this study there should be one in which the role of the PMO is analysed in every industry from manufacturing to retail and to everything that is possible. The PMO does help in making projects successful. This is accepted by all the managerial members. Sometimes the success also depends on the internal environment such as strategies, structures, politics and cultures.

**10. A Master of Science Thesis in the Master's Program International Project Management, (2012) by Bjarna Magnúsdóttir, International Project Management at Chalmers University (Sweden) was titled: "Project Management Office in International Organizations"**

Magnúsdóttir focused on Project Management Office (PMO) in international organizations. This intensive theoretical research was performed in hope to find answers to important questions as:

- a) Why is this questionable entity implemented in organizations?
- b) What are the challenges of implementing a PMO?
- c) How can this entity overcome the factors that diminish it or completely shut it down?

This provided a good demonstration on how the real life functionality of this entity can differ from what is stated in the theory. The main challenge for PMO is to get employees and the culture to become more approachable and implement change in their mind-set and by that they will become more open to the changes that PMO brings.

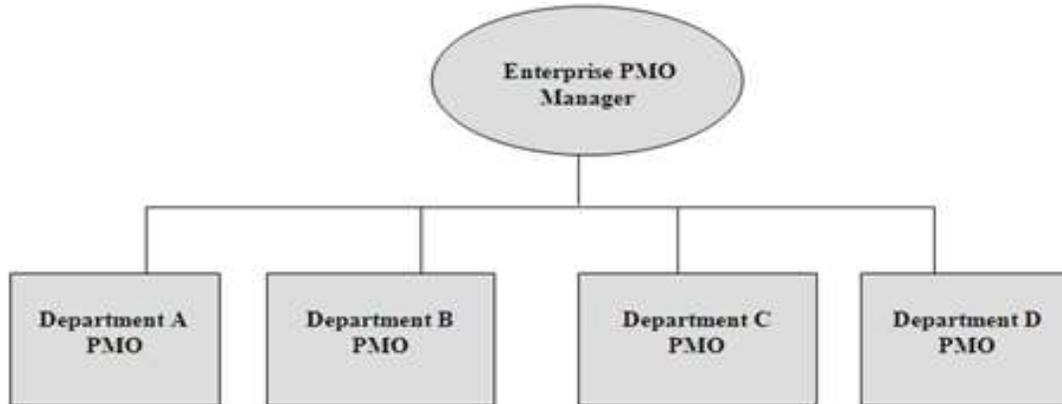
If the challenges are overcome, the PMO can bring great benefits to large organizations that have a big project base or facilities in different countries. PMO ensures an overview of the entire project load as well as implementing standards and ways of working so each project is done in a similar way by the same standards.

**11. A research that titled " Implementation Plan of Project Management Office over Enterprise Project Management Office for Beneficiaries Success in Today's Organizations "** by Ashilkumar R. Patel and Daxesh M. Patel in (Gujarat Technical University, India).

This paper highlights the challenges faced by organizations having traditional PMOs and the need for an Enterprise PMO. The paper further discusses some differentiation of EPMO over PMO, the structure of EPMO in large and small organizations, EPMO responsibilities, benefits of EPMO and the factors critical for the success of EPMO in an organization. The research shows that PMO's are more effective and can better impact the bottom line, when they are operating at the corporate enterprise wide strategic level, rather than at the departmental level. According to the research, initial effort on the part of the PMO usually included presentations to increase departmental awareness and provision of training for the management team to help ensure their understanding.

A PMO that is organizationally based versus departmentally based is more likely to get executive support. After all, project management should not be a departmental strategy; it should be an organizational strategy.

This is an example of what the Enterprise PMO structure looks like:



**Figure 1. Project Management Office**

From here on the popularity and adoption of EPMO is only going to increase as globalization increases, departments becoming more diverse and dispersed across geographies and organizations becoming more cost conscious than ever before.

**12. A research that titled "The three roles of a project portfolio management office: Their impact on portfolio management execution and success "** by Barbara Natalie Unger, Monique Aubrey in (Technic University of Berlin).

The research identified three different activity patterns, which are interpreted as distinctive roles, and showed a significant positive effect of PPMOs' coordinating and controlling roles on performance in terms of project portfolio management quality, which is a predictor of portfolio success.

The implications of this study are mainly tied to the understanding and differentiation of the various roles assumed by a PPMO, which condition its power and threshold of action in a multi-project environment.

**13.** A research that titled "**The Role of the Project Management Office**" By Andy Cuthbert, 2012.

Cuthbert investigated the specific role of PMO in a multi project environment. In a mature PMO investment is undertaken in solutions that harness the opportunities that current practices and technology make possible, and will invest effort in making it easier and more appealing to work within the context of the organizational project management approach, not outside of it. Over time, therefore a PMO should become the source for guidance, documentation, and metrics related to the practices involved in managing and implementing projects within the organization.

**14.** A research that titled "**Project management office a knowledge broker in project-based organizations**" by Sofia Pemsel and Anna Wiewiora in 2013 (Queensland University of Technology, Australia).

Pemsel and Wiewiora stressed the PMOs' potential to act as knowledge brokers between projects, and between projects and top management. This research examined the PMO's functions from a knowledge sharing perspective and explore whether or not these functions reflect the knowledge sharing needs of project managers (PMs), and examined PMOs' ability to act as knowledge brokers within PBOs, adopting PMs' perspectives and their knowledge sharing behaviours. Although this research was set in two distinct countries, Sweden and Australia, it is notable that similar patterns were observed in almost every case, which helped strengthen the emerging findings.

This research found that the PMO needs to possess multiple knowledge brokering capabilities in order to support and meet PMs' knowledge sharing behaviors. The contribution of the research is an improved understanding of the connection between PMs' knowledge sharing behaviors and how these align with PMO functions.

**15.** A research was titled "**How a Project Management Office can help the Icelandic Gaming Industry achieve its goals**" by Aolsteinn Haukur Sverrisson and Elmar Bergsson, 2013, which was presented as part of requirements for the degree of Master of Project Management (MPM) at Reykjavik University.

The aim of this paper is to explore how a Project Management Office (PMO) can assist the organization of Icelandic gaming companies, Icelandic Gaming Industry (IGI), to fulfill the goals of their strategic plan which was laid out in 2011. This research proposed some of recommendations depending on the findings of studying the general IGI environment by (SWOT analysis) as:

- a) A PMO could offer solutions to organizational problems that IGI is facing today.
- b) A PMO would be able to offer direction and act as a facilitator for the committees providing better scope on the projects being done.
- c) A PMO could also take on the role of an active project management team that would perform the task stipulated in IGI's strategic plan and in coordination with IGI's board.
- d) It would further offer much needed legal, marketing and financial consultation to startup companies that would otherwise be very costly for them.
- e) A PMO would accumulate its experience in projects that would help them develop best practice procedures that would optimize future projects undertaken and lower the risk involved.

This research believed that an IGI PMO should be setup as a functional project management office taking on specific projects that need to be resolved in accordance with IGI's strategic plans, but also offering various services to startups. It is estimated that funding a PMO for IGI would carry a considerable ROI benefitting the country.

**16.** A research that titled "**Improving Industrial Engineering Performance through a Successful Project Management Office**" by Seweryn Spalek in (Silesian University of Technology, Poland).

Spalek conducted a world-wide research with a sample of over four hundred PMO (400) cases to identify what determines the success of their operations. This study revealed that to achieve a successful operating PMO, it should focus on the activities of the PMO during two periods: short term (up to one year) and long term (two or more years).

This paper advances the current state of knowledge on PMO success factors and explores new research areas. This research analyzed data of PMO cases in three research areas (RA), one in the short term and two in the long term, and concluded the following findings:

- a) There is a strong relationship between one of the top managers as the initiator and the support of top management for PMOs at start-up.

- b) There are following top three challenges leading to the shutdown of PMOs (at this short period): the lack of top management support, wide variety of companies' transformation/changes and inability to demonstrate added value.
- c) Applying that knowledge to existing practices should lead to the improvement in industrial engineering performance through the increase of the efficacy in simultaneously managing several projects in the company. Moreover, the efficiency of operations in the multi-project environment can be enhanced by establishing and running PMO.

**17. A research that titled "Project Management Office (PMO) in International Arena - Lessons Learned from PMO's Closed-Loop Control "** by Yang Fan in (College of Business, Western Carolina University).

This paper raises a challenge for a PMO who uses traditional approaches to supervise international projects characterized with external embeddedness , and it used the case study method to gain a deep understanding of the impacts of external embeddedness on the efficacy of PMO's control mechanism.

The results showed as follows:

- a) A PMO should open its control loop to external network and promote procedural justice in managing international projects.
- b) They discovered that a closed control loop adopted by a PMO leads to its failure in supervising international projects.
- c) PMO should promote managerial openness and procedure justice by adapting its management procedures to the contingencies of the external network.

In general, this study contributes to the PMO literature by presenting lessons learned that the external embeddedness of international projects determines the role of the PMO and the way PMO manage its projects.

**18. A research that titled "Assessing Project Management Maturity in the Area of Knowledge Management in Select Companies"** by Spalek, S. 2014.

Spalek suggested the modern PMM model should definitely address the knowledge management area. In the article based on the world-wide empirical study of 400 companies, the author discusses the PMM level in the knowledge management area. The assessment was done using the author's PMM model which measured maturity in four areas: methods and tools, human resources, project environment and knowledge management. Moreover, the main aim of the study was to compare Polish and foreign companies via an examination of diverse industries. The results of the study revealed that, in general, the foreign companies are at a higher PMM level in the knowledge management area than their Polish counterparts. In addition, the study shows that the mean maturity level of all investigated companies is rather small. The reasons for that fact are explained and the implications for the companies are outlined.

**19. A Master of Science Thesis in the Master's Program International Project Management, (2014) by Epheram Demelash Getahun, International Project Management at Chalmers University (Sweden) was titled: " Project Management Office-PMO, the Relevance for Project Based Organizations".**

To understand the factors and the different mechanisms that exist in the relation between PMO and project performance, this research has elaborated the academic view of the current subject and has conducted a qualitative research study based on one case organization.

The research has found that different tasks were carried out by the PMO's experts in order to secure customer satisfaction through maintaining the helicopter views, which enables efficient project monitoring through the project life cycle as well as providing relevant support to project managers and project team members. The research indicated that client oriented PMOs tend to have a high status in the organization and seem to be sustainable in its role and existence. Furthermore, as this research is conducted in only one organization, it would be appropriate to further elaborate the topic in more organizations and similar industries to confirm its general applicability.

**20. A research that titled "The Effects of the Project Management Office on Companies Performance - A Case Study on a Project-Oriented Company "** as Proceedings of the 2014 International Conference on Industrial Engineering and Operations Management *Bali*, Indonesia, January 7 – 9, 2014 " by Shakib Zohrevandi (Master of industrial engineering, Payam Noor University of Tehran, Iran).

The purpose of this paper is to investigate the specific role of the Project Management Office (PMO) in a multi project environment that how it can implement it with more efficiency. Research indicates that project management becomes increasingly difficult when there are many overlapping projects in a project-oriented company, resulting in a need for enhanced governance controls to increase success rates.

The Project Management Office with a special model that will explain, let us to have management of multiple projects efficiently in a project oriented company. This article has been prepared because most companies have been faced to problem while doing multiple projects simultaneously, and eventually they could not finish them on time, so for solving this problem, it could using to implementation of project management office (PMO) and to use a special model and to answer the question that the method has benefit for project management office performance in the company.

**21. A master thesis of science of Project Management, 2014 by Jónína Kristin Snorradóttir, the School of Science and Engineering at Reykjavík University, was titled : "To PMO or not to PMO: A project Management Office Case Study for Flight Operations".**

The purpose of this paper is to examine the value of establishing a project management office within a Flight Operations Division, FOD and to examine whether a Project Management Office, PMO is suitable for it. The knowledge and use of project management methodology are examined and expectations of managers towards establishing a new PMO is evaluated.

**22. A master thesis of International Project Management ( Building, Real Estate and Infrastructure), 2014, by Danni Soudan, University of Applied Science Stuttgart, was titled : (Project Management Office in the Global Real Estate Market)**

This study revealed that PMOs are not established by coincidence. Their establishment is based on identifying triggers, that define their needs within the organization, before the setup process starts.

According to the research, three main triggers explains this need:

- a) Controlling and managing a large number of complex projects.
- b) Project's performance (Cost, Time and Quality).
- c) Inconsistency of project management methodologies.

Based on the identified triggers, organizations are able to define the PMO's scope description, the scope description is directly connected to the organizational strategy. In addition, In order to achieve the benefits expected from a PMO, scope description assists the organizations to set up their PMO functions. According to the research, four groups of functions are identified, as follows:

- a) Project Performance
- b) Organizational Learning
- c) Strategic Alignment
- d) Project Management Development

Therefore, the study recommends PMOs to be a key player in the development of project management. The positive impact of project management development on all organizational levels will be providing a framework of tools, process and metrics for PMs that lead them to address the organization strategic goals.

**23. A research that titled " A Framework to Establish a Project Management Office " by Hanadi Salameh in (School of Economics and Business Administration, Al-Zaytoonah University, Jordan).**

This research presents a framework of the needed steps and process to establish a successful Project Management Office (PMO). This framework is driven by the different functions and roles that may be performed by a Project Management Office (PMO) as well as the type of PMO that would best serve organizations. As mentioned above, the research outlined the necessary steps to this process, through ;

- a) The framework is driven by an organization's strategic objectives, business needs, and mission.
- b) The framework is driven by the functions expected of the PMO to ensure alignment with the organization's strategic objectives.
- c) Outline the requirements to insure PMO managers are in a better position to reengineer their provision of services and support to execute an organization's portfolio of projects and strategic initiatives.
- d) To enhance success, it must ensuring continuous executive supports, as well as collaboration across the various divisions of the organization.

**24.** A research that titled " **Implementation of a Project Management Office in a Public Sector Organization: A Case Study Involving a Sanitation Institution** " by José C. Esquierro and André B., do Valle in (Universidade Federal Fluminense, Brazil).

This paper proposes recommendations for improving the implementation of a Project Management Office (PMO) in a government organization. Therefore, this study aims to show how implementing a PMO can ensure proper management of strategic projects related to conservation of water resources and shows that the effectiveness of actions taken by the PMO is strongly influenced by how this process is implemented.

This study focused on an essential dimension that the implementation of a PMO and a new project management methodology, based on the best practices suggested by PMBOK, can bring more efficient and effective outcomes for municipal sanitation policies. The suggestion that there will be a better use of public resources, with no need for large investments in physical infrastructure and new employees, may pave the way desired.

From this perspective, the study proposes changes in Municipal Water and Sewage Department, SEMAE (as a public company in Brazil and the case study) aiming to make it a project-oriented company in the near future and this is the mission of SEMAE as a public sector company established to promote quality of life to the population of Piracicaba aligned with the urban environmental demands of the twenty-first century.

**25.** A research that titled " **Project Management Office – Typology and Benefits** " by Velimir Tasic in (University of Warsaw), was published in *Business Informatics* 1 (31), 2014.

Tasic formulated a research approach based on the experience of practitioners with more than fifteen years of project management (PM) experience. The author explores the created assumptions of a project management office (PMO), which underlie this research, and provides a research literature review of specific PM research originating from this perspective. The purpose of writing this paper was to explore the challenges of projects and a PMO in the complexity of project organization system relationships and in the project research literature .

Firstly, Tasic summarizes what is commonly associated and defined with a PMO in the PM literature. Later, he delved deeper into the challenges, by exploring generic PMO approaches from the perspective of both PMO typology and benefits. Tasic *presented a brief investigation of the creation and the reconfiguration of PMOs as an organizational advantage. The objective of the paper is to contribute to a better understanding of PMOs and of the dynamic relationship between the PMO and the PM context in contemporary organizations.*

*Finally, Tasic highlights the need for both researchers and practitioners to beware of how they describe the knowledge, dimensions, skills, challenges and various other aspects of PMOs, in such ways they ought to be open to new knowledge which may further enrich the research and theory development of PM literature as well as PM best practice.*

**26.** A Ph.D. dissertation of Project Management (2014) by Assam M. Hussein for Open Academic in Denmark, was titled, **The Evaluation of the Role of Consulting Engineering Offices in the Project Management Operations**

Hussein identified the international standards and local requirements in the field of engineering consultancy and technical monitoring in terms of services and functions and technical surveillance, and clarify the principles and the key factors that can be measured over a consulting offices efficiency to provide technical and administrative services that support the project's success and satisfaction of owner authorities about the time, cost and quality and scope of work. This study aims to assess the role of consulting offices in the engineering construction projects from the point of view of a sample of the workers in engineering offices, and that through the utilization of documented scientific studies as well as Personal interviews and analysis of the survey results that have been prepared and distributed to the study community (King Faisal University).

In addition, there are other papers were studied by this chapter and this research in general, like:

**27.** A research that titled "**The Project Management Office: Aligning Strategy & Implementation**" was published by the Project Management Institute in April, 2014.

**28.** A research that titled "**The Effect of Project Management Office Role in the Delivery of Technology Projects in Mobile Communication Companies in Kenya**" by Kevin K. Munyoki , Agnes W. Njeruin (Jomo Kenyatta University of Agriculture and Technology), 2014.

29. A research that titled "Challenges in Establishing, Managing, and Operating a Project Management Office" by Hanadi Salamah, 2014.

30. A research that titled "Investigation and assessment of the Project Management Methodology in Iraqi Construction Sector " by Al-Zwainy et al, 2016.

31. A research that titled " Application Project Management Methodology in Construction Sector: Review " by Al-Zwainy et al, 2016.

### CHARACTERISTICS AND ADVANTAGES OF THE PREVIOUS STUDY

Appendix (A) shows the summary of the previous studies through the following points:

- 1) Research Author.
- 2) Research Year.
- 3) Research Location (country).
- 4) The research aim.
- 5) Research Population.
- 6) Research Tools and techniques
- 7) Research results.

### LATEST STUDY IN 2016 IN IRAQ

Table 1 shows a comparison between the Latest study in 2016 (Alaa M., 2016) and the previous studies, where the latest study aimed to assess the status quo of the PMO in Iraq and the development model of maturity to evaluate the performance indicators for construction projects by State Company of Oil Projects in Oil Ministry in Iraq.

**Table 1. Comparison Between the Latest Study and Previous Studies**

| Latest study in 2016 |  |
|----------------------|--|
| Research Location    | Iraq   |
| Research Aim         | Assess the status quo of the PMO in Iraq and The development model of maturity to evaluate the performance indicators for construction projects .                      |
| Research Population  | The construction sector in the Oil in Iraq.  |
| Research Tools       | Documentation Data, archives, survey questionnaire and semi-structured interviews and direct observation, Maturity model   |
| Statistical Means    | Software Statistical Package Social Science (SPSS), Microsoft Excel, word, and inferential statistics, knowledge that was gathered through the literature review       |
| Research Case Study  | State Company of Oil Projects / Oil Ministry in Iraq.  |
| Previous studies     |  |
| Research Location    | UAE, KSA, Jordan, Europe, Italia, Austria, - Poland, Germany, Iceland Sweden, Ireland Greece, Finland USA, -Iran, Kenya, South, Korea, Brazil, India, Mexico, Malaysia |
| Research Aim         | As a whole, investigate the (PMO) status and role, and explore the challenges of projects and a PMO establishment  |
| Research Population  | Different sectors  |
| Research Tools       | Questionnaire, knowledge that was gathered through the literature review   |
| Statistical Means    | Different of statistical analysis  |
| Research Case Study  | Different Organizations.   |

### CONCLUSION

This study is the first attempt that focuses on Project Management offices (PMO) and PM practices, processes in Iraq. In most of the world, there is a great interest with the roles and responsibilities of PMOs in the construction sector and other sectors and as a result of that interest increased the number of successful projects which deliver with their time, cost and meet specifications of them through improving the level of maturity in companies. Whereas the previous studies was conducted in UAE, KSA, Jordan Italia, Austria, Poland, Germany, Iceland,

Finland, Iran, Kenya, USA, Iran, South Korea, Brazil, India, Mexico, Malaysia, Sweden, Greece and Ireland in different organizations. These studies aimed to investigate the (PMO) status and role and explore the challenges of projects and a PMO establishment as a whole and the targeted population was different sectors. These studies used a questionnaire, interviews (direct and online survey), archival records, interviews and direct observation as the research tools. Besides that, questionnaire analysis, statistics and knowledge that was gathered through the literature review were utilized as statistical means of analysis the results. The latest study in 2016 was conducted in Iraq, which aimed to assess the status quo of the PMO in Iraq and the development model of maturity to evaluate the performance indicators for construction projects and the targeted population was the construction sector in the Oil sector in Iraq. This study used "the Documentation Data, archives, survey, questionnaire, semi-structured interviews, direct observation and Maturity model" as the research tools, beside that the Software Statistical Package Social Science (SPSS), Microsoft Excel, word), and inferential statistics, knowledge that was gathered through the literature review were utilized as statistical means of analysis the results. So, the State Company of Oil Projects owned for the Oil Ministry in Iraq, was the case study of it.

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| Research elements<br>Researches<br>Titles   | Author<br>, Year      | Research<br>Locati<br>on | Research<br>Aim  | Research<br>Target<br>Popula<br>tion          | Research<br>Tools and<br>Technical  | Research Results   |
|---|-----------------------|--------------------------|--|---|---|--|
| How does the Project Management Office deliver value to the organization?                   | Keating ,D.<br>2009   | Ireland                  | PMO functions to deliver value to the Organization                                     | IT, Health and Energy sectors                 | Questionnaires & Interviews   | By performing the roles and functions described in the PMO Value Framework they are contributing to increasing project management maturity levels within their organization. |
| The PMO as an innovative tool for the Public Electricity Organization                       | Symeonidi, M.<br>2010 | Greece                   | Studying the Public Electricity Organization which incurred to a lot of loses recently | The Public Electricity Organization in Greece | Questionnaires & Interviews   | The researcher proposed the most appropriate solution for this organization is the establishment of a PMO  |
| Implementation of PMO in Middle East  | Al Rawi, S.<br>2010   | UAE                      | Investigate the (PMO) status and awareness in organizations in the UAE.                | Various engineering organizations             | Questionnaires and interviews with the Project Managers   | Improving the overall environment in PMO's of Middle East by highlighting the challenges faced by PMO  |
| The Influence of the efficacy of the program management office on IT project success rates. | Sprouse, L.<br>2010   | USA , Chicago Land       | Examine efficacy of the PMO with the IT project success rate                           | (IT) projects                                 | 1)Survey questionnaire and semi-structured interviews<br>2) the NVivo 8 qualitative analysis software | Optimize the institutionalization of the PMO into the organizational infrastructure and leverage the efficacy toward the successfulness of project managers                  |
| Improving project management capability with assistance of PMO in a technology              | Gorshkova, E.<br>2011 | Sweden                   | How establishment of a PMO would bring value   | Engineer. customer service                    | Questionnaires , Interviews & Direct  | 1)Assigning different responsibilities and level of authority over different types of projects (and the need for their   |

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| company   |  |          | to a services company ?  | s companies                                  | observation   | categorization).<br>2)location of PMOs in the organizational units understanding a need for it.   |
| A Perspective on prioritization in project portfolio environment .  | Lindblom, D., and Eberhard, H.<br>2011 | Sweden   | The implementation of a project prioritizing strategy                  | Swedish industrial sector                    | Recording interviews  | The PMO would ensure that all project managers update the database in a formalized way it would be possible for the portfolio manager and the governance team                             |
| How to establish a Project management Office (PMO) .  | Rania Al-Maghra by<br>2011             | -        | Outline the importance of a PMO in an organization, its intended role. | Different sectors                            | Documentation, archival records, interviews and direct observation          | 1) It summarizes the sequence of broad line steps that are followed in order to setup the PMO.<br>2) details the activities carried out in order to accomplish each step of this process. |
| Establishing a Project Management Office for a more Effective and Efficient implementation of Projects in JKR . | AbRahman, H.<br>2011                   | Malaysia | Developing a PMO model to improve JKR PM practices                     | Public Works Department (PWD)<br>JKR company | 1)Recording interviews :<br>2)audiotape, videotape recording<br>3)PMO model | The proposed PMO is able facilitates JKR to implement projects more effective and efficient   |
| What is the influence of Project Management Office in regard to client expectation in IT industry, Ireland .    | Purohit, K.,2012                       | Ireland  | Examine impact of PMO practices and methodologies on IT Cos.           | Irish software industry(IT industries)       | 1)survey questionnaire and semi-structured interviews<br>2)SPSS program     | The adoption of the project management methodology and practices among IT companies has proven to be very popular with the advancement of IT in one's life.                               |
| Project Management Office in International Organizations .  | Magnúsdóttir, B.<br>2012               | Sweden   | Find answers to challenges of implementing PMO                         | Different sectors                            | Documentation, archival records, interviews and direct observation          | This provided a good demonstration on how the real life functionality of the PMO can differ from what is stated in the  |

|  |   |   |  |                                     |   | theory   |
|--|---|---|--|-------------------------------------|---|--|
| The Reality of PMO for Cons. Org. in the Oil, Gas and Petrochemical Industry of Iran   | Homayoun I., Hani A. and Baqer Kord<br>2012 | Iran  | This study examines the existence of the PMO procedures and implementation of functions organizations in the central projects which take into account the knowledge of the main roles of these organizations | Oil & Gas Industry                  | Interviews with open-ended survey.  | The PMO in Iran is at the beginning of the road. While drawing the correct targets for implementation it that take place of traditional project management to project management strategy can be create a lot of success factors for projects. |
| Implementation Plan of Project Management Office over Enterprise Project Management Office for Beneficiaries Success in Today's Organizations. | Patel, A., and Patel, D.<br>2012            | INDIA   | The challenges faced by organization having traditional PMOs and the need for an Enterprise PMO  | The global State of the PMO studies | –   | The research shows that PMOs are more effective and can better impact the bottom line, when they are operating at the corporate enterprise wide strategic level, rather than at the departmental level.  |
| The three roles of a project portfolio management office: Their impact on portfolio management execution and success.                          | Unger, B., and Aubry, M.<br>2012            | Austria , Canada , Finland , Germany, South Korea | The roles provided by PMO and a self-assessment tool to diagnose and chart the existing activity patterns  | Various industries                  | 1) Questionnaires (multinational survey ).<br>2) Multi-item measurement scales & regression analysis. | The implications of this study are mainly tied to the understanding and differentiation of the various roles assumed by a PPMO, which condition its power and threshold of action in a multi-project environment.                              |
| The Role of the Project anagement  | Andy Cathper                                | –   | Investigate the specific   | Different                           | 1)Document ation,   | the coherent PMO must invest in creating   |

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| Office.  | t, pmp<br>2012  |                       | role of (PMO) in a multi project Environment                                  | sectors                     | interviews and direct observation<br><br>2) knowledge that was gathered through the literature review | capabilities that are more effective and more relevant than the personal practices of individual project managers and teams  |
| Project management office a knowledge broker in project-based organizations .                            | Sofia Pemsel and Anna Wiewiora<br>2013                  | -                     | Examining PMO's functions from a knowledge sharing perspective                | Project based organizations | Semi – structured interviews  | This research found that the PMO needs to possess multiple knowledge brokering capabilities in order to support and meet PMs' knowledge sharing behaviors  |
| How a Project Management Office can help the Icelandic Gaming Industry achieve its goals .               | Aoalsteinn Haukur Sverrisson and Elmar Bergsson<br>2013 | Iceland               | PMO assessment for IGI to achieve its strategic goals                         | Gaming industry             | 1)Interviews with open-ended by Skype .<br><br>2) SWOT analysis                                       | This research believed that an IGI PMO should be setup as a functional project management office taking on specific projects that need to be resolved in accordance with IGI's strategic plans         |
| Improving Industrial Engineering Performance through a Successful Project Management Office.             | Spalek, S.<br>2013                                      | Survey over the world | To improve organizational performance<br><br>PMO success factors              | Industrial engineering      | web questionnaire on PMI website .  | This paper advances the current state of knowledge on PMO success factors and explores new research areas  |
| Project anagement Office (PMO) in International Arena – Lessons Learned from PMO's Closed-Loop Control . | Fan, Y.<br>2013   | UAE / Dubai           | Raising a challenge for a traditional PMO to supervise international projects | oil & gas cooperation       | first-hand knowledge, archives, and interviews  | This study contributes to the PMO literature by presenting lessons learned that the external embeddedness of international projects determines the role of the PMO and the way PMO manage its projects |

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| Assessing project management maturity in the area of knowledge management in select companies.                     | Spalek, S. 2014       | Poland & the western part of Europe and North America. | The assessment of PMM level in Polish and Foreign companies           | Polish and foreign companies          | 1) The web-based questionnaires<br>2) Project Management Maturity model                   | The results of the study revealed that, in general, the foreign companies are at a higher PMM level in the knowledge management area than their Polish counterparts.   |
| Project management Office-PMO, the Relevance for Project Based Organizations .                                     | Getahun, D.2014       | Sweden   | The relation between PMO and project performance .                    | Energy sector                         | 1) Audio recorded interviews<br>2) Both inductive and deductive analytical procedures     | 1) The research has found that different tasks were carried out by the PMO's experts in order to secure customer satisfaction through maintaining the helicopter views.<br>2) providing relevant support to project managers and project team members. |
| The Effects of the Project anagement Office on Companies performance - A Case Study on a Project-Oriented Company. | Zohrevandi, Sh. 2014  | Iran   | Investigate the specific role of (PMO) in a multi project Environment | Engineering customer services company | 1) Questionnaires in TSTA Company<br>2)Both inductive and deductive analytical procedures | This article has prepared because most of companies have been faced to problem while doing multiple projects simultaneously, and eventually they could not finish them on time, the solution is the implementation of PMO.                             |
| To PMO or not to PMO: Aproject Management Office Case Study for Flight Operations. .                               | Snorraddóttir, J.2014 | Iceland  | Examine the value of establishing a PMO with a FOD                    | Airline in Iceland                    | 1) Interview by online survey<br>2) SWOT analysis   | The knowledge and use of project management methodology is examined and expectations of managers towards establishing a new PMO is evaluated.  |
| A Framework to Establish a Project Management office.  | Hanadi Salameh 2014   | Jordan   | Presenting a framework of the needed steps to establish a successful  | The global State of the PMO           | 1) The 2013 PMI Pulse of the rofession survey<br>2)Both                                   | 1) This framework is driven by the different functions and roles that may be performed by a (PMO) as well as the type of PMO that  |

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|   |                                  |                             | PMO   | studies                            | inductive and deductive analytical procedures                             | would best serve organizations.<br><br>2) The research outlined the necessary steps to this process   |
| Implementation of a Project anagement Office in a Public Sector Org.: A Case Study Involving a Sanitation Institution . | Esquierro, J., and do Valle 2014 | Brazil                      | Proposes recommendations for improving the implementation of a (PMO) in a government org. | Brazilian government organizations | 1) First-hand knowledge, archives<br>2) Deductive analytical procedures   | The study proposes changes in Municipal Water and Sewage Department, SEMAE (as a public company in Brazil and the case study) aiming to make it a project-oriented company in the near future and this is the mission of SEMAE as a public sector company.  |
| Project anagement Office – Typology and Benefits  | Tasic, V. 2014                   | Poland                      | Explore the challenges of projects and PMO .  | Four economic sectors              | Interviews with experts from 4 Orgs.                                      | The author highlights the need for both researchers and practitioners to beware of how they describe the knowledge, dimensions, skills, challenges and various other aspects of PMOs, in such ways they ought to be open to new knowledge which may further enrich the research and theory development of PM literature as well as PM best practice |
| The evaluation of the role of consulting engineering offices in the project management operations                       | Essmaail, E. M. 2014             | KSA Kingdom of Saudi Arabia | Role of Cons. Offices in execution construction projects .                                | Engineering Cons. Offices          | Questionnaire<br>Interviews & Questionnaire Analysis<br>Statistics (SPSS) | This research stressed that the absence of knowledge, administrative and scientific capabilities to PMOs in the consulting causes the failure to achieve the organizations goals.   |
| The Effect of Project anagement Office Role in the Delivery of  | Munyoki, K., and Njeruin         | Kenya                       | The effect of Project Management Office role  | The Communication                  | Questionnaires (multinational survey )                                    | 1)Project completion within time is therefore affected by the level of involvement in   |

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| Technology projects in Mobile Communication Companies in Kenya                  | , A. W<br>2014        |     | in the delivery of technology projects  | sector            | Both descriptive statistics and inferential statistics | strategic planning.<br>2)PMOs need adequate funding and hence it is suggested they receive sufficient budgets to run their activities.  |
| Challenges in Establishing, Managing, and Operating a Project Management Office | Salama h, H.,<br>2014 | UAE | Identify the challenging factors leading to the success or failure of the PMO establishment | Different sectors | Documentation, interviews.                             | 1)The role of the (PMO) in organizations continues to be a topic of great interest to project Management practitioners.<br>2) All the surveyed PM practitioners reported that the PMO was partially successful due to several encountered challenges. |

**APPENDIX (A). THE LITERATURE REVIEW SUMMARY**