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Examining the Significance and Value of Project Management Office (PMO) in Comparison with Project Portfolio Management Office (PPMO) and its Impact on Government Projects Using TQM Model in Ghana

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Abstract
Project portfolio management (PPM) is evolving swiftly and becoming the main tool of managing complex project environment. Many organisations are adopting this system in an effort to achieve a better strategic alignment, reduce organisational project complexity, increase the project success rate and improve utilisation of organisation's resources. The paper aims to examine motivations for implementation of PPM and its alignment with business strategies. This empirical evidence is to be confronted with literature. The aim of this dissertation is to assess the relevance of PMO and PPMO for ATU under the Ministry of Education in Ghana, through the day to day project activities. The research will explore both the theoretical aspect of PMO and PPMO as well as the use of it in a real project as a case study. Level of organizational maturity, project size in a given organization etc. are normally vastly different from one organization to another. The same can be also said for one and the same organization containing different departments where project methodology applied varies between the departments. Thus, the research, in addressing its aim, attempts to find out an answer for the research question:Why and how the use of the project management office and project portfolio management office is relevant for project-based organizations? To narrow down and to take a closer look of the research question the author puts the spot light on one specific area of interest: Improving project performance. The objective of this paper is to shed some light on ways to determine the value that PMOs can have for their host organisations, by studying the effect that a specific PMO & PPM has on its host organisation. A before-and-after case study was performed on this organisation; by comparing the project environment before and after the establishment of the PMO & PPM, this study is able to indicate the impact that the PMO is perceived to have had on the organisation. It is proposed that there are unexplored ways of determining the value of a PMO & PPM. It is also proposed that the value of a PMO & PPM can be determined by analysing the impact that a PMO & PPM has on an organisation, and that the value of the PMO & PPM can be linked to the functions it is mandated to perform. In the process of exploring ways to determine the value of a PMO. The study is rich in practical implications for organisations. The paper adds novel insights that can improve the success of project portfolio management in practice.

Keywords: *Project Management Office, Project Portfolio Management Office (PPMO), Government Projects, Total Quality Management*

I. INTRODUCTION

Although the concept of a project management office (PMO) or project office (PO) has been around for many years, the functions, purposes, and definitions of these offices have changed over time. The PMO evolved from a project office (PO) that was responsible for one project or programme, usually a major government-funded project (1950-1990), to the more multi-project management scenarios currently found (Kerzner, H. 2003.). The PMO keeps evolving and changing as the needs of industry change and as new principles and methodologies are developed. It is therefore necessary for a PMO to change and adapt continually to an organisation's needs in order to remain valuable (Pallegrinelli, S. & Garagna, L. 2009.). Currently, the project management discipline is involved in a wide variety of industries. The functions and purposes of PMOs are also varied to the extent that there is no single scheme that can describe the ideal set of functions and purposes of the PMO (Hobbs, B. & Aubry, M. 2007.). The variations are obvious from the various definitions of a PMO. For example, the definitions given for a PMO in A Guide to the Project Management Body of Knowledge (PMBOK Guide) varies between the 4th (2008) and 5th (2013) editions (Project Management Institute (PMI). 2008, & Dai, C.X. & Wells, W.G. 2004.). The former mentions that the role of a PMO can range from providing support functions to being responsible for the direct management of projects, while the latter

emphasizes standardization and facilitating the sharing of resources, methodologies, tools, and techniques. Ward, as cited by Dai and Wells (Dai, C.X. & Wells, W.G. 2004.), gives a third definition of the PMO, which includes 'strategic matters'.

This is interpreted as a mandate that includes the function of project portfolio management. The mandate of the PMO selected for this case study is a combination of the three types mentioned above. First, it is a mutli-project PMO or Project Portfolio Management Office (PPMO) that is responsible for providing project support and managing projects and programmes directly. It also includes a Centre of Excellence (CoE) that is the custodian of the project management governance, methodologies, tools, and techniques, and provides strategic management input to the organisation. Hobbs and Aubry (Hobbs, B. & Aubry, M.) support the point that there is a large variability in the roles, function, structures, and legitimacy of PMOs between organisations. From their survey of 500 organisations, they realised that PMOs found in industry vary significantly from what is found in the literature. The main differences lie in the structures and roles/functions of the PMO, as well as the perceived value of the PMO. The reason why there is such variation in the structures and roles of PMOs is that there is no 'onesize-fits-all' solution. PMOs are structured and mandated according to the needs of the organisations within which they function; thus no two PMOs are the same. This makes the task of measuring the impact of or value added by the PMO difficult; each PMO adds value in different ways. Unless an appropriate method of determining the value of a PMO is used, invalid conclusions can be reached about the value that a specific PMO contributes. Therefore, the objective of this paper is to shed some light on ways to determine the value of a PMO.

Unger et al. (Unger, B.N., Gemunden, H.G. & Aubry, M. 2012.) state that the roles of PMOs and the impact of these roles in terms of value creation are unclear. They even claim that there is no empirically validated evidence that the involvement of PMOs in project management has increased project performance or organisational performance. The lack of empirical evidence for PMOs in general is understandable, given that the functions and purposes of the PMO are so varied. The value added by a PMO is as varied as the functions of the PMOs. Unger et al. (Unger, B.N., Gemunden, H.G. & Aubry, M. 2012.) claim that a PMO adds value to an organisation and to a portfolio of projects; in their work, they propose alternative methods to determine the value added by a PMO. They link the specific roles of a PMO to the value created by each role. Aubry et al. (Aubry, M., Hobbs, B. & Thuillier, D. 2007.) summarise various methods that have been used in the literature to attempt to measure the value or performance of a PMO. These methods include the return on investment (ROI) of a PMO, a pragmatic method, the balanced score card method, and success factors. The financial measures are problematic. For example, the ROI of a PMO is very difficult to determine, as a PMO generally does not contribute directly to the bottom line of an organisation. With the pragmatic measures defined by Aubry et al. (Aubry, M., Hobbs, B. & Thuillier, D. 2007.), the value of the PMO is also very difficult to determine.

The balanced score card method is based on ROI and thus has the same problems as other financial measures. The success factors contribute to the understanding of the conditions that might lead to success, but they do not give an indication of the performance of a PMO. The roles, value, and legitimacy of PMOs in industry are varied to the extent that there is no empirical validation for the performance increase due to a PMO, or of the value created by a PMO [(Aubry, M., Hobbs, B. & Thuillier, D. 2007.)]. The literature also provides ambiguous views about the value of a PMO [9]. Many PMOs are found not to add value, or to add very little value, especially if the direct return on investment is used as a measure. The literature that indicates that PMOs do add value claims that PMOs add value in ways other than a direct financial benefit.

1.1 Background of the Study

It is first in the 1990s that organizations started to realize that their initiatives and objectives could be essentially achieved via projects. Thus, the critical competency in this regard started to take shape. As a result of this and continual evolvement of the field, an organizational project office started to merge in developing and/or maintaining project management competency (Hurt & Thomas, 2009). One of the research topics, which are gaining more and more momentum in the arena of project management, is Project Management Office (PMO) (Aubry, Hobbs, Muller, & Blomquist, 2010). The Project management Institute (PMI) has also shown major interest for this emerging organizational entity (Hurt & Thomas, 2009). The PMO's concept is driven forth from the assumption that an organization is in need of a central point in order to standardize management methodology, create efficient information flow, and administers control systems (Dai & Wells, 2004). Even though every project is unique in its own way, there are always elements of project management practices which are common for all and do not need to be reinvented for

every project-, program-, and/or project portfolio. It is here the need of improvement for effective and efficient project management gets shaded by the spotlight of many organizational strategies (Hurt & Thomas, 2009).

Project based organizations (PBOs), according to Pellgrinelli and Garagna (2009) are perceived to have the potential to nurture innovation and advance effective management and leadership across different functions of the organization's business. In this, a huge responsibility lies on project managers, not only to focus on management elements such as team-building, address client needs, struggle with technological uncertainties etc. but also to make sure of the value realization for the organizations investments as whole (Pellegrinelli & Garagna, 2009). In all this the project managers are expected to ensure the intended success out of every project (Hobday, 2000). However, project managers have a tendency to be driven more to the technical details of projects and, for several reasons give less attention to the effort needed in order to make sure projects are mirrored to overall organizational strategies and objectives (Hobday, 2000). The purpose of PMO is to make sure that projects and project managers get support internally in making sure that project activities are done systematically and effectively by means of recognized best practices, standard project methodology and information flows in which a logical and efficient manner is practiced. There is, however one misconception about PMO where many people try to see it as an organizational entity being one-size-fits-all, in providing services for all type of organizations. PMOs are contextual, very dynamic and often in transition from one structure and charter to the next (Aubry et al., 2010). The recorded empirical evidences, in regard to the benefits of implementing a PMO are still very few (Liu & Yetton, 2007). However, advantages of different organizational entities in general are well documented. But the fact remains the same that project failure rates are still high. Thus, improving existing organizational methods and strategies to ensuring a strong project performance has always been the focal point (Dai & Wells, 2004).

1.2 Problem Statement

Many PBOs today have realized that there is a need for a PMO in order to achieve effective and efficient project management in terms of support, control for delivering of project values, sustainable business strategies etc. (Hill, 2004). As many studies indicate, proper use of PMO as an organizational entity plays a significant role in PBOs. This is especially in regard to enhancing the way multi-projects are managed in PBOs. Thus, this issue of PMO has been addressed through a variety of forms of PMOs implementations and authorizations among practitioners (Aubry et al., 2010). Even though the very dynamic context that exists within PMOs is capable to solve different organizational issues, major mistakes take place due to wrong configuration of PMOs. In fact, these wrong configurations have even caused PMOs to be terminated in different organizations. However, the wrong configurations, in other cases have also caused correction and transition of PMOs to more enhanced and configured versions that serve better and last longer (Hatfield, 2008). One important way of addressing this enhancement is to nurture the ongoing journey of the PMO. For instance, one of the major reasons for lack of project management efficiency is the factor of the non-time nature of projects, i.e. few benefits from previous successes and failures are drawn from, due to a lack of effective knowledge transfer (Dai & Wells, 2004). A methodology of project management in this regard offers a standard, which is a repeatable process to steer project performance from the very concept to the completion.

Furthermore, it enables to pull all the documentation/project data through a defined and structured manner in a single data repository for future use (Gerard, 2014). One of the core aspects of PMOs, in terms of project management methodology is that it introduces management techniques and practices, which are generally accepted in the field of project management that can fit within a relevant organization to meet required business needs. Prior to 2005 practitioners and researchers had settled for a common belief that it was possible to have one best practice for PMOs, i.e. a limited numbers of PMOs to be able to use for all project contexts and scenarios. However, since 2008 it is now more common to hear and observe that PMOs vary very much, change a lot and at the same time become more and more mature (Hobbs & Aubry, 2010). Research taking a closer look at how practitioners perceive and use PMOs in their day to day activities could identify important key success factors for PMO improvement. Nowadays, it is also noticed that even the project management competencies and skills possessed by a project team cannot give any guarantee of project success. Furthermore, different parts of organizational functions have also nowadays a major influence in an organization on how projects are initiated and how management processes are handled. Thus, it is not only the project team or the project manager who needs to learn and adapt the management process, but also everyone in the department involved (Young, 2013).

2.0 LITERATURE REVIEW

Managing multiple sets of projects simultaneously is a challenge organisations have to master today in order to implement their strategic objectives (Artto and Dietrich, 2004; Dietrich and Lehtonen, 2005). Although the project management literature still focuses primarily on single projects, research in the last 5 years has increasingly acknowledged that multi-project issues have become critical for all organisations regardless of delivering projects to external or internal customers. Multiproject PMOs have emerged within these multi-project management environments as a major device to develop competence in project management, manage single project performance and coordinate multiple projects and actors. Project portfolios that include multiple unrelated single projects and/or various programmes are focus of this study. Recently, studies have furthered general knowledge on PMOs, including their description (Hobbs and Aubry, 2007) and their relationship to context and transition (Aubry et al., 2010a, 2010b). Other studies have addressed PMOs' part in organisational change (Pellegrinelli and Garagna, 2009) or as a value-realising function (Hurt and Thomas, 2009). Hobbs and Aubry (2007) show that PMOs' organisational characteristics and mandates vary significantly, highlighting the existence of a wide and diverse range of PMOs. These authors explain, "The organizational reality surrounding PMOs is complex and varied organizations establish a great variety of PMOs to deal with their reality" (p. 85). To provide a clearer picture of the mandates of multi-project PMOs, these findings suggest that PMOs should be differentiated based on comparable realities such as project portfolios. In this paper, we consider project portfolio management offices (PPMOs), which are multi project PMOs dedicated to project portfolio management.

Operative PMOs that only handle a single project or one programme are disregarded. Pellegrinelli and Garagna (2009) confirm that "multi-project PMOs are organizations' responses to their needs and environments unique structural arrangements designed to fulfil a specific purpose" (p. 651). Continuing this notion of purpose specificity, we follow the task-oriented paradigm of organisational design and organisational theory, which states that tasks and sub-tasks should follow the requirements of the organisation (Burton et al., 2011; Mackenzie, 1986). Therefore, we posit that the task environment is critical for identifying and defining the appropriate tasks to be undertaken by PPMOs and for detailing the activities that enforce the objectives of these tasks. A major feature of the task environment of a PPMO is its organisation's first-tier senior management, who are typically the owners of all the firm's project portfolios. Fundamentally, the tasks of PPMOs may be derived from these key stakeholders' requirements and their need to delegate management obligations. From a task delivery perspective that considers all participating personnel who contribute and collaborate in managing project portfolios (Gemünden et al., 2008), the project portfolio manager is a prominent participant (Blomquist and Müller, 2006; Jonas, 2010). In this vein Jonas (2010) proposes multiproject PMOs to take up being project portfolio manager "as a central coordination unit that supports the senior management with its specialized knowledge about project portfolio practices" (p. 823). Jonas (2010) contributes the attributes of role clarity and role significance to provide a formal role definition for the project portfolio manager. The present paper builds on this conceptual work, which fundamentally grasps what project portfolio managers are and how others perceive them, to characterize the day-to-day practice of PPMOs as project portfolio managers. PPMOs' operational roles are based on the management demands of first-tier senior managers, which are linked to the typical PPM phases to determine the activity patterns that comprise. PPMOs' involvement in PPM. We consider the activity patterns and actual contributions of PPMOs when performing assigned tasks (role taking), rather than their formally stated roles (role making), to outline the configuration of PPMOs in practice. Formal role statements often raise expectations that PPMOs cannot fulfil with their limited power and resources.

Furthermore, these roles are formulated purposefully as generic statements because a more precise formulation would not reach consensus due to the high potential for conflict among the expectations of the stakeholder groups of a PMO. By examining activity patterns, which are translations of the required tasks into everyday work, while each pattern makes up a role, we clarify the action of PPMOs when managing project portfolios. Thus, we refrain from listing every individual task performed and use a higher level of abstraction to understand roles as dimensions of social Behaviour (Morrison, 1994; Webster and Wong, 2008). Research on roles in the governance of project management and PMOs is not new, but this research has been extremely sparse and varied. First, Turner and Keegan (2001) proposed two roles, the "broker" and the "steward", when discussing governance mechanisms in project-based organisations, confirming two separate activity patterns in interface and resource management, respectively. Second, Blomquist and Müller (2006) identified the role of middle managers in programme and portfolio management. Third, Hobbs and Aubry (2007) provided a fundamental understanding of the roles of PMOs through a

framework that grouped five sets of tasks, potentially forming five general PMO roles. Recently, interest in the roles of PMOs has intensified, with Hobbs and Aubry (2011) and Müller et al. (2011) proposing typologies of PMOs. In general, however, the understanding of PMOs' roles and the impact of these roles on value contribution and creation remains unclear. Thus, the acceptance, existence and legitimacy of PMOs remain at stake (Pellegrinelli and Garagna, 2009). Acknowledging that PMOs have a low life expectancy of four years, on average (Hobbs and Aubry, 2007), Pellegrinelli and Garagna (2009) illustrate the effects of changes in an organisation on PMOs: "The PMO can be the battle ground between empowerments and control, between people and processes, and between political factions" (p. 652). This observation suggests that the closure of PMOs may be a case of collateral damage rather than a natural death due to a lack of purpose or unnecessary activities. Thus, with the existence of PMOs in question, Pellegrinelli and Garagna (2009) point out the need for PMOs to battle for altered organisational needs and their stakeholders' changing preferences by acting as "the fulcrum between forces for centralisation — the tendency for decision and policy making, executive powers and resources allocation to reside in a dedicated (line of) business unit or corporate function and decentralisation the tendency for decision and policy making, executive powers and resources allocation to be devolved throughout the organisation to individuals or operating unit" (p. 652). Thus, in an attempt to outlive fads and fashion manoeuvres and to justify and sustain the existence of multi-project PMOs, Pellegrinelli and Garagna (2009) recommend that multi-project PMOs be re-shaped as an organisational construct, allowing PMOs to become agents, rather than reactionaries. In this paper, we respond to this call and conceptualise a PPMO that is in charge and operationally manages project portfolios to produce a clear value proposition.

Hence, we identify the performance contribution of individual PPMOs' roles. We aim to extend the findings of a quantitative study in which the engagement of project portfolio managers, who are often the heads of PPMOs, has been shown to have a significant positive impact on the execution quality and success of PPM (Jonas et al., 2011a). Ultimately, these results should establish the fundamental legitimacy of PPMOs. In showing the positive performance impact of PPMOs, we substantially extend the existing research. Previous attempts to provide evidence for a performance increase as a result of PMOs' involvement in project management or in overall organisational performance offered little empirical validation. Quantitative research on the impact of PMOs on single project management has failed to show a relationship between PMOs' involvement and improved performance (Dai and Wells, 2004; Kwak and Dai, 2000). In a qualitative study of 65 organisations, Thomas and Mullaly (2008) showed the near

2.2 The Need for Project Management Office

It is commonly known that the way businesses operate, especially in knowledge intensive organizations, are through projects. However, statistics indicate that 50% to 80% of the projects fail to reach their overall goals (Desouza & Evaristo, 2006). These problems usually display themselves in failing, among others to deliver on time, overrunning budget in terms of estimated resources and time, failing to meet customer expectations etc. The underlying cause of this alarming scenario is indicated in the cause and effect explanations of the fact that organizations are repeating the same mistake over and over again. The two major problem areas, among others, are falling short to reuse information from completed projects as well as failing in transferring or sharing knowledge to others. Furthermore, the problem areas get even worse when it is orchestrated in additional weakness such as lack of: management consistency, formal tracking means, functional user involvement etc. (Desouza & Evaristo, 2006).

Quite often there are conflicts between executives and project managers over resources and deadlines. The same goes between project manager and resource manager and even between project managers themselves. Issues like what resource to allocate to which project, how many, when can a task starts etc. use to be longstanding issues which affects project performance negatively (Kendall & Rollins, 2003). This problem lays on the fact that most of new projects are just initiated by functional executives regardless the required resources are available or not. It is quite common that projects are kicked off without any coordination or collaboration between functional executives (Kendall & Rollins, 2003).

It is often observed that PBOs which are handling multiple projects, using shared resources and capacity which designed initially for few project initiatives, tends to initiate too many projects without matching the resource available. Thus, inevitably, resources will be multitasked in different projects. Often time this takes place just to make functional executives satisfy at here and now, without having a clear strategy on how to handle it throughout the project life cycle. This leads to, among others; more time is invested in project reviewing, project rework etc. (Kendall & Rollins, 2003). Kendall and Rollins (2003) points also out that research shows a lot of projects that are investigated,

using project resources inefficiently in completing project earlier would have been generated and contributed much more benefits to PBO in general if resources had been used efficiently (Kendall & Rollins, 2003).

Research shows nowadays that PMOs can step by step guide different project management disciplines to aliening project management processes with overall objectives of an organization. This is primarily to ensure the expected return on investment within the organization as well as to secure stakeholders satisfactions (Desouza & Evaristo, 2006). Desouza and Evaristo (2006) points out a survey (IPM) involving 450 managers where 67% of the involved organizations had a PMO in place and the fact that the longer a PMO was active; the greater was the value it added in terms of project performance improvement, project management efficiency etc.(Desouza & Evaristo, 2006). First and for the most, PMO is not a one size fits all solution for organizations. There is no blueprint on how to establish a PMO either (Desouza & Evaristo, 2006). The one and only criterion PMO has is that its structure is as closely aligned to the organization's corporate culture as it possibly can. Thus, there is no one universal definition of a PMO since it highly involves an exercise of both customization and sustained effort (Desouza & Evaristo, 2006). A lot of organisations have established PMOs in recent years. However, PMOs started to become popular already in 1994 (Hobbs & Aubry, 2010). In the telecom, defence and aerospace industries the use of PMOs has been common (Desouza & Evaristo, 2006). Referring to different functionality and authority, PMOs may have many different structures and names (Desouza & Evaristo, 2006).

PMO is also advancing in getting consensus in organizations where high technology projects such as IT, offshores projects etc. are involved. However, in the construction sector where building and civil engineering projects are involved there is still reservation in questioning what additional value an organizational entity as PMO may add in terms of, among others, project performance. Traditionally the main focus of PBOs is on project scheduling and resource allocation without paying enough attention to the underlying mechanisms behind (Engwall & Jerbrant, 2003). In fact, after decades of initiatives for improving project management processes, project managers, especially in building and civil engineering sector, still fail in recording numbers not reaching predefined project goals. Consequently executives are fired in many occasions. The underling puzzle here is that when activating too many projects the system fails badly due to different reasons. For instance, for a project manager, executing not all of the right projects but only a few of them just to match the resource available, leads often to results not reaching the organization's overall goals. This is a day to day struggle for project managers to solve in order to achieving a breakthrough impact through project life cycles (Kendall & Rollins, 2003)

2.3 The Need for Project Portfolio Management Office

While project management and program management have traditionally focused on "doing work right," portfolio management is concerned with "doing the right work." The term "portfolio" has been in use for some time and is used throughout many diverse organizations; therefore the term has come to represent different meanings. For the purpose of this paper, the focus is on "project portfolio" management. It will be referred to simply as "portfolio" management (Project Management Institute, 2006). Defined, a portfolio is a collection of projects (temporary endeavors undertaking to create unique product, service, or result) and/or programs (a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually) and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives. Portfolio management is an approach to achieving strategic goals by selecting, prioritizing, assessing, and managing projects, programs, and other related work based upon their alignment and contribution to the organization's strategies and objectives. A portfolio reflects investments made or planned by an organization, which are aligned with the organization's strategic goals and objectives. It is where priorities are identified, investment decisions are made, and resources are allocated. If a portfolio's components (projects, programs, and other works) are not aligned to its organizational strategies, the organization can reasonably question why the work is being undertaken.

Figure 1

The top of the triangle ("Vision," "Mission," and "organizational strategies and objectives') illustrates the components used to *set* the organization's performance targets. The middle of the triangle ("High-level Operations Planning and Management" and "Project Portfolio Planning and Management") *establishes* the distinct initiatives required to achieve the organization's performance targets. "Management of On-going Operations" and "Management of Authorized Programs and Projects') which appear at the bottom of the triangle, correspond to *executing* the operational, program, and project activities to realize the organization's performance targets. Both the operational and project aspects of an organization must be considered in portfolio management. At the tactical level management (the middle of the triangle), the question is: "Is this operation or project managed efficiently with optimal results, from an optimum use of resources, with optimum effort, and complying with organizational values and standards?" The shaded section "Project Portfolio Planning and Management" depicts the relationship between the organizational strategy, strategic planning, and management activities. This relationship is highlighted due to the traditional focus on the portfolio management on strategic project planning. To guide "the Management of Authorized Programs and Projects," a strategic project portfolio is created. This strategic portfolio, which links the organizational strategy to a set of prioritized programs and projects, addresses the relevant internal and external business drivers referenced as objectives in the strategic plan.

2.4 The Role of Project Portfolio Management

Portfolio management ensures that the collection of projects chosen and completed meets the goals of the organization. Just as a stock portfolio manager looks for ways to improve the return on investment, so does a project portfolio manager. However, a stock portfolio manager would be embarrassed if he or she could not answer the questions, "What is the value of my portfolio? How has the portfolio value changed since the last reporting period?" In project portfolios, key information to answer these vital questions is often missing. Every PMO and every organization without a PMO should have someone designated in the role of project portfolio manager (Kendall & Steven, 2003). If all of the chosen projects are completed to perfection (on time, on budget, within scope), but they do not even come close to meeting the goals of the organization, then there is something wrong or missing in the portfolio management process. In our terms, project portfolio management has six major responsibilities:

- *Determining a viable project mix, one that is capable of meeting the goals of the organization.*
- *Balancing the portfolio, to ensure a mix of projects that balances short term vs. long term, risk vs. reward, research vs. development, operation vs. project etc.*
- *Monitoring the planning and execution of the chosen projects.*
- *Analyzing portfolio performance and ways to improve it.*
- *Evaluating new opportunities against the current portfolio and comparatively to each other, taking into account the organization's project execution capacity.*
- *Providing information and recommendations to decision makers at all levels.*

2.5 Project Management Office (PMO) in Comparison With Project Portfolio Management Office (PPMO)

Project Management Office is an office used to address common project or programme management in an organisation to support and facilitate project success. Project Management Office typically does not exist beyond the lifespan of the project or program it supports. The meaning of the acronym PMO varies mainly as a result of structural or functional needs. The acronym PMO can stand for Project Management Office or Programme Management Office, which is confusingly also abbreviated as PMO. There is even talk of a Project Office (PO), a Project Control Office (PCO), a Central Project Office (CPO), and a Project Support Office (PSO). What matters is what something does, not what it is called. After all 'a rose by any other name would smell as sweet'. Depending on specific conditions such as importance of the desired change, organisation maturity, impact on the existing organisation, complexity, size, budget, expert availability, interdependencies with other projects and programmes a PMO can exist in different ways. Project Management Office provides a specific project to deliver the desired result by helping the project manager and project team to manage the project. The scope of a Project Management Office is project activities from start to hand-over to the operations department. The main purpose is to increase project success: delivering the pro-defined result within specified conditions. (2017 PMBOK).

Project portfolio management offices (PPMOs) are a subset of project management offices (PMOs) that handle collections of multiple single projects and programmes, i.e. portfolios. PPMOs are centralized organizational units that cater to the demands of various stakeholders by performing specialized tasks. They are initiated by their organization's leadership in response to increasing management challenges originating from project portfolios. Although there has been considerable research on PMOs in general, not only a clear understanding of multi-project PMOs' activity patterns set in specific contexts like project portfolio management, but also both existence and mode of multi-project PMOs' contribution to successful performance are still lacking. By quantitatively analyzing PPMOs in 278 portfolios, the work will identify three different activity patterns, which are interpreted as distinctive roles.

The 'common' way of thinking in many organizations about the subject PMO is to view a PMO as a temporary organizational unit that provides services like implementation and enforcement of a project or programme management standard, administrative support, standardized project or programme templates and tools, and development and harvesting of reporting data. The focus of a PMO is on supporting a single project or programme manager in the execution, from initiation to completion. A PMO ensures that the right project or programme information reaches the boardroom in time, complete and accurate. So the leadership and management will be able to make the right decisions to achieve project success. Projects and programmes are an integral part of business and are key vehicles to realizing business strategy. The next step in the evolution of thinking about PMO is in the view the PPMO (Project Portfolio Management Office). A PPMO is a permanent organizational unit, responsible for support within the context of project portfolio management. The objective of project portfolio management is to ensure that the right projects are done and to make sure the projects are done the right way. The interests of an organization's project portfolio are best served by a PPMO. The PPMO is responsible for the proper conduct and performance of the project portfolio management process. A PPMO differs from the 'traditional' PMO in a number of aspects:

- The focus of a PPMO is on the optimization of investments to achieve strategic organizational objectives, whereas the focus of a 'traditional' PMO is only on delivery of agreed project results.

- A PMO is a temporary organizational unit that is created for the support during the execution of a project, while a PPMO is permanent organizational unit, which is created for the support to accomplish the strategic organizational objectives. The work of a PPMO takes place in the area of organizational 'strategic alignment', whereas a PMO solely works on the procedures and processes of a project.

- The contacts of a PPMO are predominantly with executives and those of a PMO with project managers.

- The added value of a PPMO is creating cross-functional synergies, i.e. identifying dependencies and consistency of business functions such as IT, Marketing, HR, Procurement and Finance, and solving common conflicts between them. Often a difference in the footprint of a PMO and PPMO can be seen: the footprint of a PPMO can be global whilst that of a PMO can be limited to one region, country, location, department or project.

Managing multiple sets of projects simultaneously is a challenge organizations have to master today in order to implement their strategic objectives (Artto and Dietrich, 2004; Dietrich and Lehtonen, 2005). Although the project management literature still focuses primarily on single projects, research in the last 5 years has increasingly acknowledged that multi-project issues have become critical for all organizations regardless of delivering projects to external or internal customers. Multi-project PMOs have emerged within these multi-project management environments as a major device to develop competence in project management, manage single project performance and coordinate multiple projects and actors. Project portfolios that include multiple unrelated single projects and/ or various programmes are focus of this study.

Recently, studies have furthered general knowledge on PMOs, including their description (Hobbs and Aubry, 2007) and their relationship to context and transition (Aubry et al., 2010a, 2010b). Other studies have addressed PMOs' part in organizational change (Pellegrinelli and Garagna, 2009) or as a value-realizing function (Hurt and Thomas, 2009). Hobbs and Aubry (2007) show that PMOs' organizational characteristics and mandates vary significantly, highlighting the existence of a wide and diverse range of PMOs. These authors explain, "The organizational realities surrounding PMOs are complex and varied … organizations establish a great variety of PMOs to deal with their reality" (p. 85). To provide a clearer picture of the mandates of multi-project PMOs, these findings suggest that PMOs should be differentiated based on comparable realities such as project portfolios. In this paper, it will consider project portfolio management offices (PPMOs), which are multi-project PMOs dedicated to project portfolio management (PPM). Operative PMOs that only handle a single project or one programme are disregarded. Pellegrinelli and Garagna (2009) confirm that "multi-project PMOs are organizations' responses to their needs and environments unique structural arrangements designed to fulfil a specific purpose" (p. 651). Continuing this notion of purpose specificity, follow the task-oriented paradigm of organisational design and organisational theory, which states that tasks and sub-tasks should follow the requirements of the organisation (Burton et al., 2011; Mackenzie, 1986). Therefore, it will posit that the task environment is critical for identifying and defining the appropriate tasks to be undertaken by PPMOs and for detailing the activities that enforce the objectives of these tasks. A major feature of the task environment of a PPMO is its organisation's first-tier senior management, who are typically the owners of all the firm's project portfolios.

Fundamentally, the tasks of PPMOs may be derived from these key stakeholders' requirements and their need to delegate management obligations. From a task delivery perspective that considers all participating personnel who contribute and collaborate in managing project portfolios (Gemünden et al., 2008), the project portfolio manager is a prominent participant (Blomquist and Müller, 2006; Jonas, 2010). In this vein Jonas (2010) proposes multiproject PMOs to take up being project portfolio manager "as a central coordination unit that supports the senior management with its specialized knowledge about project portfolio practices" (p. 823). Jonas (2010) contributes the attributes of role clarity and role significance to provide a formal role definition for the project portfolio manager. The present paper builds on this conceptual work, which fundamentally grasps what project portfolio managers are and how others perceive them, to characterise the day-to-day practise of PPMOs as project portfolio managers.

PPMOs' operational roles are based on the management demands of first-tier senior managers, which are linked to the typical PPM phases to determine the activity patterns that comprise PPMOs' involvement in PPM. The work will consider the activity patterns and actual contributions of PPM and PPMOs when performing assigned tasks (role taking), rather than their formally stated roles (role making), to outline the configuration of PMO and PMO and PPMOs in practice. Formal role statements often raise expectations that PPMOs cannot fulfil with their limited power and resources. Furthermore, these roles are formulated purposefully as generic statements because a more precise formulation would not reach consensus due to the high potential for conflict among the expectations of the stakeholder groups of a PMO. By examining activity patterns, which are translations of the required tasks into everyday work, while each pattern makes up a role. The work will clarify the action of PMO and PPMOs when managing project portfolios. Thus, it will refrain from listing every individual task performed and use a higher level of abstraction to understand roles as dimensions of social behaviour (Morrison, 1994; Webster and Wong, 2008). Research on roles in the governance of project management and PMOs is not new, but this research has been extremely sparse and varied. First, Turner and Keegan (2001) proposed two roles, the "broker" and the "steward", when discussing governance mechanisms in project-based organisations, confirming two separate activity patterns in interface and resource management, respectively. Second, Blomquist and Müller (2006) identified the role of middle managers in programme and portfolio management. Third, Hobbs and Aubry (2007) provided a fundamental understanding of the roles of PMOs through a framework that grouped five sets of tasks, potentially forming five general PMO roles. Recently,

interest in the roles of PMOs has intensified, with Hobbs and Aubry (2011) and Müller et al. (2011) proposing typologies of PMOs. In general, however, the understanding of PMOs' roles and the impact of these roles on value contribution and creation remains unclear. Thus, the acceptance, existence and legitimacy of PMOs remain at stake (Pellegrinelli and Garagna, 2009). Acknowledging that PMOs have a low life expectancy of four years, on average (Hobbs and Aubry, 2007), Pellegrinelli and Garagna (2009) illustrate the effects of changes in an organisation on PMOs: "The PMO can be the battle ground between empowerments and control, between people and processes, and between political factions" (p. 652). This observation suggests that the closure of PMOs may be a case of collateral damage rather than a natural death due to a lack of purpose or unnecessary activities. Thus, with the existence of PMOs in question, Pellegrinelli and Garagna (2009) point out the need for PMOs to battle for altered organisational needs and their stakeholders' changing preferences by acting as "the fulcrum between forces for centralisation the tendency for decision and policy making, executive powers and resources allocation to reside in a dedicated (line of) business unit or corporate function and decentralisation the tendency for decision and policy making, executive powers and resources allocation to be devolved throughout the organisation to individuals or operating unit" (p. 652). Thus, in an attempt to outlive fads and fashion manoeuvres and to justify and sustain the existence of multi-project PMOs, Pellegrinelli and Garagna (2009) recommend that multi-project PMOs be re-shaped as an organizational construct, allowing PMOs to become agents, rather than reactionaries.

This work will respond to this call and conceptualise a PPMO that is in charge and operationally manages project portfolios to produce a clear value proposition. Hence, it will identify the performance contribution of individual PMO and PPMOs' roles. The work aim to extend the findings of a quantitative study in which the engagement of project portfolio managers, who are often the heads of PPMOs, has been shown to have a significant positive impact on the execution quality and success of PPM (Jonas et al., 2011a). Ultimately, these results should establish the fundamental legitimacy of PPMOs. In showing the positive performance impact of PPMOs, it will substantially extend the existing research. Previous attempts to provide evidence for a performance increase as a result of PMOs' involvement in project management or in overall organizational performance offered little empirical validation. Quantitative research on the impact of PMOs on single project management has failed to show a relationship between PMOs' involvement and improved performance (Dai and Wells, 2004; Kwak and Dai, 2000). In a qualitative study of 65 organizations, Thomas and Mullaly (2008) showed the near impossibility of calculating the direct impact of single projects managed by PMOs for return on investment. In two other qualitative studies, Aubry and Hobbs (2011) and Aubry et al. (2011) suggested that the performance of a PMO should be assessed by its contribution to organizational performance. These studies proposed a multi-dimensional framework that acknowledged the coexistence of competing values in any organisation. From this perspective, assessing a PMO's performance is likely to be an organizational dialogic process involving criteria and indicators. More recently, Hobbs and Aubry (2010) used the concept of a PMO's embeddedness in its context to explain 48% of the variance in project performance, whereas the structural characteristics and functions of the same PMOs explained only 28% of the variance. These are encouraging findings, but they are based on exploratory data analysis, and the performance measures are broadly defined. Further research is needed to explain and validate these findings. The will therefore posit the following: despite increasing research efforts, solid empirical evidence for the positive impact of multi-project PMOs on performance is still lacking.

In light of so many unsatisfactory attempts to answer the fundamental question of PMOs' contribution to performance, it is not surprising that consultants and academics increasingly focus on this topic (Aubry et al., 2010a). Of primary interest is to extent previous inconclusive research on the value of PMOs (Dai and Wells, 2004; Hurt and Thomas, 2009) and to answer the critical open question of PMOs' performance contribution, which, in principle, would justify the existence of a multi-project PMO. The popularity of this research area despite its failure to produce fundamental evidence has also generated criticism. Some academics dismiss the concept of PMOs as a temporary fashion (e.g., Crawford, 2010). It is argued that the academic community participates in constructing and nurturing an empty shell and that isomorphism may be at play, considering the high level of information flow (DiMaggio and Powell, 1983). Against all odds, this study analyses PPMOs as a subset of PMOs that manage project portfolios. Departing from organizational theory, it aim to describe PPMOs' activity patterns as a way to cater for organizational and stakeholder needs, independent of individual preferences. Thus, it will strictly focus on management requirements in connection with the project portfolio setting, and it will disregard PMOs that are designed to manage single projects or programmes. The work aim to present the roles derived from PPMOs' typical activity patterns by statistically integrating similar tasks to reduce complexity.

2.6 Bridging the Gap between Strategic Planning and Implementation

Several missing links are identified that cause a gap to exist. These missing links slow down the implementation and often cause an excellent strategic direction to become dysfunctional. The paper presents the critical integrative links that are essential to attain integrated and high-velocity implementation (White & Patton, 2002). The call for an execution-oriented paradigm suggests that an integration gap exists between strategic plan and its implementation. Closing the gap is essential to attain and sustain a competitive advantage. However, a common problem in firms is that several integrative links between the strategic plan and strategic implementation are often missing. The links, often missing, include the following:

1. **Focus on Strategic Implementation:** Substantial interest has developed in processes used to manage multiple projects. Some common names for such processes include project portfolio management. Upon reviewing these processes, it is clear that first missing link in implementing the strategic plan is the absence of an implementation process that is focused on the portfolio of strategy-fulfilling projects.

2. **Common Top-Down Understanding:** The strategic plan, particularly the strategies, must be driven down to a portfolio of projects and programs that fulfill the strategic plan. In addition, strategic guidelines must exist to communicate executive intent of the strategic plan throughout the organization. Otherwise, the strategic plan becomes unfocused due to multiple conflicting interpretations at lower levels. Disconnect in both directions are often found to exist in organizations.

3. **Organizational Focal Point:** A vertical implementation, rather than a cross-organizational implementation, invariably occurs. Delegating responsibilities to the functional VPs is a common problem.

4. **Alignment Across Functions:** The key here is making priority, resource, and other trade-off decisions among all of the critical important projects. Separately delegating this to the individual VPs does not always provide integrated solution. Unclear priorities and competition for resources often results in internal chaos.

5. **Executive Transition Mitigators:** Frequent turnover of executives often results in dramatic implementation slowdowns. The missing link is the process that will maintain positive organizational inertia, thereby, mitigating the negative effects of such transitions. Having project management standards, guidelines, and approaches in place is essential so that all are using the same methods and communicating in the same language throughout the organization, and strategic progress continues during transition.

6. **Feedback Loop:** Another missing link is a comprehensive set of performance metrics and control reports that enable feedback, organizational learning, and continuous improvement over time. The absence of continuous improvement gives competitors time to learn and duplicate the firm's best practices.

3.0 RESEARCH METHODOLOGY

In this chapter a description of the applied research method and an explanation for how it can enable the study in answering the established research questions are given. Nowadays, there are many different methods and approaches one can consider in social research world. A couple of research method and approach such as interviews, observations and questionnaires are some of which has been evaluated. The strength and the weakness of the selected research method are also uncovered through an overview of the method. In order to ensure respectable research practice, ethical considerations and research ethics are also presented at the end of this chapter.

3.1 Research Design

Research methodologies in general refer to social research and its implications in terms of philosophical, political and social backgrounds. It is also a way of handling the implications it may have for research practice where a method is consisting of specific techniques in acquiring and analyzing data or knowledge. Thus, methodologies are strategies of enquiry in order to guide a set of procedures (Petty, Thomson, & Stew, 2012). There are many different ways of conducting research, especially when it comes to how to collect research data (Bryman, 2012). The great

divide here, in terms of research methodologies is whether the method applied has its point of departure from qualitative or quantitative research methodology point of view, perhaps even the mix of it (Polit & Beck, 2010). Qualitative research methodology is commonly used as an umbrella term to cover a broad range of research methodologies involving different epistemological positions (Petty et al., 2012).

The critiques of qualitative research, in comparing with quantitative research methodology, address the issue of the research being too subjective, difficult to replicate, difficulties of generalization and lack of transparency (Bryman, 2012). However, the main target of most qualitative researches is not, among others to be able to generalize the findings so it can be extracted from its context but to serve a deep, contextualized understanding of a certain aspect of human activity and experience (Polit & Beck, 2010). Some of the common contrast between qualitative and quantitative research are listed below in table 3.2-1.

Qualitative	**Quantitative**
Participants point of view	Researcher point of view
Contextual understanding	Generalization
Close researcher	Distant researcher
Theory emergent	Theory testing
Natural settings	Artificial settings
Unstructured	Structured
Deep, rich data	Reliable, Hard data

Table 3.2-1: Common contrast between qualitative and quantitative as adabted from Bryman (2012).

Quantitative research, in its deductive nature targets the testing of theories whereas qualitative research's focal point is commonly centred at the generation and establishment of theories. Thinking of the present research topic, its established research questions and the inherent difficulty in measuring involved issues like knowledge sharing etc., the author has concluded a qualitative research method to be the appropriate one.

3.2 Ethical Consideration

Ethical considerations in research are critical. Ethics are the norms or standards for conduct that distinguish between right and wrong. They help to determine the difference between acceptable and unacceptable behaviors. Why are ethical considerations so important in research? First, ethical standards prevent against the fabrication or falsifying of data and therefore, promote the pursuit of knowledge and truth which is the primary goal of research. Ethical behavior is also critical for collaborative work because it encourages an environment of trust, accountability, and mutual respect among researchers. This is especially important when considering issues related to data sharing, co-authorship, copyright guidelines, confidentiality, and many other issues. Researchers must also adhere to ethical standards in order for the public to support and believe in the research. The public wants to be assured that researchers followed the appropriate guidelines for issues such as human rights, animal welfare, compliance with the law, conflicts of interest, safety, health standards and so on. The handling of these ethical issues greatly impact the integrity of the research project and can affect whether or not the project receives funding. Because ethical considerations are so important in research, many professional associations and agencies have adopted codes and policies that outline ethical behavior and guide researchers. These codes address issues such as honesty, objectivity, respect for intellectual property, social responsibility, confidentiality, non-discrimination and many others. These codes and policies provide basic guidelines, but researchers will still be faced with additional issues that are not specifically addressed and this

will require decision-making on the part of the researcher in order to avoid misconduct. The resources on this page address many of those issues and the case studies used in these resources provide excellent examples of these types of issues.

One of the most important ethical considerations in research is the use of human subjects. To address these considerations, most institutions and organizations have developed an Institutional Review Board (IRB). An IRB is a panel of people who help to ensure the safety of human subjects in research and who assist in making sure that human rights are not violated. They review the research methodology in grant proposals to assure that ethical practices are being utilized. The use of an IRB also helps to protect the institution and the researchers against potential legal implications from any behavior that may be deemed unethical. Examples of some of these issues include voluntary participation and informed consent. These principles are followed to guarantee that all human subjects are choosing to participate of their own free will and that they have been fully informed regarding the procedures of the research project and any potential risks. Ethical standards also protect the confidentiality and anonymity of the subjects. Review the following slideshow to begin understanding the key ethical considerations for researchers and the history of ethical issues in research. This slideshow is a comprehensive discussion of ethical issues that researchers may face and provides definitions of key terminology for new researchers. This slideshow includes the use of case studies to illustrate many of these considerations.

3.3 Research Methods

To get a holistic view and understanding of an organization, it is important to pay attention to the pattern of organizational phenomena and the context in which different form of interactions takes place. In other words, not only the distinct organizational properties (Fox-Wolfgramm, 1997). There are five commonly used methodologies and methods in in regard to qualitative research method. These are case study, grounded theory, phenomenology, ethnography and narrative research. As it briefly indicated earlier the issue of generalization is a bit complicated. This is mainly because of generalization requires extrapolation one can never fully justify for the very reason that findings in this method are embedded within the context that they are driven from (Polit & Beck, 2010). However, in order to be able to draw broader conclusions from specific cases and make an inference about what is unobserved, the act of generalization based on what is observed is necessary(Polit & Beck, 2010).The main strategy here is to bring forth a rich and contextualized understanding of human experience by carrying out an intensive study of particular cases (Polit & Beck, 2010). Further to this the author narrows down the research scope and focuses to one specific area namely the PMO and project performance and uses the research method of a single case study.

Result: Generally speaking, there are three most important criteria for a set of data that is collected as a foundation of any social research. These are reliability, replication and validity. Thus, the process involved on how to collect the data will play the major role in the view of the three mentioned criteria. However, some researchers have suggested that the three mentioned criteria need to be evaluated or judged according to a bit different criteria when it comes to a quantitative research methodology. Thus, the alternative two primary criteria established for qualitative research are trustworthiness and authenticity (Bryman, 2012). Trustworthiness has four cornerstones; where each one of the cornerstones has an equivalent of quantitative research criteria as well. As a result, the present research has considered trustworthiness and authenticity as the foundation and route of the data collection method.

Furthermore, the collection of data is carried out by conducting semi-structured interviews. Semi-structured interviews seem to have potential to unfold in a conversational manner and this is an advantage for the participants to explore issues they consider is vital. By means of open-ended questions the interviewer reserves himself /herself from reining the interview tight and instead allows the subject to be explored much in depth and from different angels as it fits the participants (Longhurst, 2009). With this background, after weighing different methods for data collection, the method of semi- structured interviews is applied in this study. A number of interview topics and questions were prepared in advance as an interview guideline and are conducted at the RE's Oil and gas department. The issue of handing out the questions for the semi-structured interviews in advance to the respondents became an issue, when two of the respondents asked for it. After giving it some thoughts and had a brief consultation with the research supervisors, on how it may affect the quality of data, the handing out of the interview questions decided to be okay. The motivation to this lays in the nature of the chosen research method and tools along with the focus and purpose of the study, i.e. seeking opinion about something specific which exists in the practice of the case study organization. Thus, the more

the respondents are informed before the interview the better chance to making a good use of the limited interview time available for each respondent.

The interview question was given to all respondents in advance, meaning not only for those two explicitly asked for it. The other aspect of the research strategy was to find the right mix of the respondents from the case organization. In order to obtain a deep and broad contextual of the case study, a strategy of targeting respondents with different role in a shared context are established. The author, being advised by the case organisation's adviser, selected respondents consisted of top management, functional manager, senior project manager, project manager and PMO members. The number of the respondents was set as a target to be between six and ten, and resulted to be eight.

Questionnaires: One of the most important basic foundations, which are commonly on the spotlight of analysing qualitative data, is the principle of using a research technique to generating replicable and valid inferences from the collected data to their context. This lays on the basis of the premise that the vast amount of words form the interviews and the interviews memo notes can be minimized to categories enabling the words share the same implication or meaning (Westbrook, 1994) (Bryman, 2012). PMO and PPMO has been practiced for some time within the Projects discipline of the case organization. PMO and PPMO has been perceived by this discipline as contributing to the success registered in recent years. As a research strategy, what kind of role and function this PMO involve were identified at early stagy before the case study started. The department has been working with one big project for more than three years now. This project is in the focus of this research.

Respondent's category and role

Respondent (RP)	Category	Role
RP 1	PMO	Proactive Project Planer
RP 2	PMO	Project Economist
RP 3	PMO	Head of Procurement
RP 4	Top management	Head of Department
RP 5	Top management	Head of Sub-department
RP 6	Project manager	Senior Project Manager / Group Leader
RP 7	Project manager	Project Leading and Engineering
RP 8	Project manager	Project leading and Engineering

For the first three respondents belonging the PMO was chosen for the simple reason that they are the main responsible persons for the corresponding PMO functions. However, when it comes to the other respondents RP 5 and RP 6 they were recommended by head of department (RP 4). The last two project managers were recommended by the senior project manager (RP 5). In creating this mix of respondents the author aimed a holistic view through a natural setting to develop contextual understanding based on the participant's point of view as the qualitative method implies (Bryman, 2012).

Interview Questions' Structure: Swedish language is both the native and work language of the respondents. Thus, the semi-structured interview questions were carefully interpreted to Swedish so that the respondents would understand the questions in there context. The interview questions had four main sections. The sections were structured

so they would reflect and serve the research main and sub questions. The questions in Section A, consisted of 4 questions aimed to get a general insight in how the respondent reflects over the overall aspect of project support system in their daily activities. The 4th question was deliberately formulated to get the respondents feedback in what grade the term PMO is used in their daily activities, or if they use another equivalent term for it. The questions in Section B, consisting of 4 questions, where focused more on the background and the reason for why PMO was established in the first place. Section C, with its 3 questions was designed to take the conversation to a deeper level, approaching the main focus of the study, i.e. project performance. Last but not least, Section D, with its 5 questions was designed to address two aspects. One is weather PMO plays a major role in terms of knowledge repository for the lesson learned and the other was to identify the major challenges and benefits of working with PMO. The total number questions were 16. All interviews were taped and respondents signed a consent form to take part in the study.

Data Collection: It is noteworthy to mention that, as the semi-structured interviews intend, the interview questions were not followed always strictly as it was presented to the respondents. At times, the respondents answer for one question led to related topics that accentuated the respondent's personal perception (Longhurst, 2009) (Bryman, 2012). These kinds of divergences from the established interview-template could have led to sources of error in the research. However, it is the author's believe that the deviations has contributed more to the enrichment of the data collected than affecting the data negatively. The case organization has its office on two different stories, where the department of Oil and Gas is located on the lower story. To create a comfortable environment for the respondents an interview room was booked for all interviews at the upper story of the two stories mentioned. The interview time was booked for all within their ordinary working hours, i.e. between 8:00Am and 4:00 PM. The interview was conducted in a closed room. Furthermore, in order to make the data analyse easier at a later stage, the interview was audio recorded.

4.0 DATA ANALYSIS

The methodology employed in this research is a pre-post type case study: the organisation was examined before and after the implementation of the PMO. Various methods of data gathering were used, including interviews, archived data, direct observation, and participant observation. Each research question required a different method or methods to obtain the answer.

4.1 Content of Research Site

4.1.1 Research Question 1: Why was the PMO created?

In order to answer this question, interviews were held with the manager of the current PMO CoE and members of the original Community of Practice (CoP) that was established before the PMO was created. Interviews with key management personnel were also held to determine the rationale behind the establishment of the PMO and problems that needed to be solved. Semistructured interviews were conducted. Very few sources that explicitly state why PMOs are created were found in the literature. Kerzner (2913) indicates that the reasons for creating PMOs include increased coordination, improved information availability, improved resource utilisation, improved operational efficiency, improved control, and increased quality. Aubry, M., Hobbs, B. & Thuillier, D. (2007) indicate that PMOs are created to reduce the failure rate of projects, to gain more control over cost, to improve the predictability of project cost estimates, to be able to execute bigger and more complex projects, to improve project quality, and to improve confidence in the ability to execute projects. The PMO studied by Aubry, M., Hobbs, B. & Thuillier, D. (2007) was also created with the specific purpose of bringing about an organisational change. This research question is a very important one to answer, as it is the starting point of creating a PMO. If a PMO is not created with a specific purpose in mind, an ad hoc approach will be followed to mandate the PMO, and the PMO will be destined to fail (Hobbs, B. & Aubry, M. 2007). In order to study any similarities of the case under consideration with previous work, the interview results were compared with the reasons found in the literature for creating PMOs.

4.1.2 Research Question 2: What functions is the PPMO mandated with?

The answer to this question was found in official company documentation. The official mandate of the PMO answered the question about the functions with which the PMO is mandated. Several authors describe a variety of functions with which a PMO & PPMO can be mandated (Kerzner, H. 2003, Dai, C.X. & Wells, W.G. 2004, Unger, B.N., Gemunden, H.G. & Aubry, M. 2012.). The functions mentioned by the above authors overlap, but more than 30

different 155 functions were identified. No single PMO will be mandated with all of these functions; a PMO will be mandated with the combination of these functions that best suits the organisation in which it is operating.

4.1.3 Research Question 3: What impact is the PMO & PPMO perceived to have on the PPMO?

This question was the most difficult one to answer, and several methods were used to obtain the answer. One effect a PMO has on an organisation is that it improves the project management maturity level of the organisation (Hobbs, B. & Aubry, M. 2007). In order to determine what effect this particular PMO had on the subject organisation, the Project Management Institute's (PMI) Organisational Project Management Maturity Model, or OPM3®, was used to determine the project management maturity of the organisation before and after the implementation of the PMO. The organisation had used the OPM3 model to establish project management maturity before the implementation of the PMO, and the measurements were repeated two years after the implementation of the PMO in order to obtain comparative results. The first survey was conducted during 2010, two years before the establishment of the PMO in 2012; the second survey was conducted in 2014, two years after the implementation of the PMO.

As a change in project management maturity of the organisation cannot necessarily be assumed to be caused by the implementation of the PMO, this method was supplemented by other methods. Other methods to answer this question included interviews, archival data, direct observation, and participant observation. Semi-structured interviews were conducted with key personnel in the company to determine the effect that the PMO had on the company. The interviewees included senior management, PMO management, PMO clients, PMO personnel, and some key personnel outside of the project management environment, such as financial accountants. Archived data and official company documentation were studied to determine the changes made in the company's structures, as well as in changes in Key Performance Indicators (KPIs) used to measure the performance of the project portfolio. Projects executed under the new methodologies and governance processes were also observed and compared with projects executed before the PMO had been established, in order to determine whether there were any differences in project outcomes.

4.1.4 Research Question 4: How does the PMO fulfil its purpose?

The answer to this question was derived from the semi-structured interviews.

4.1.5 Research Question 5: What value is added by the PMO?

This question was answered by analysing the effects/impacts that were determined from Research Question 3. The perceived value of the PMO was discussed during the interviews. Direct observation was also used to determine the value of the PMO.

4.2 Analysis of the Questionnaires

Demographic Statistics: The demographic statistics in Table 4 depict the gender distribution of the respondents in this study. The demographic statistics have been included in Table 4 to identify which gender dominates in the various ATU in relation to project execution.

Table 1

Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	190	77.6
Female	55	22.4
Total	245	100

The gender distribution of the respondents reveals that over 77% are male while the remaining are females. Generally, there are more male workers at the ATU than females. The gender distributions in the sample, therefore, captures the distribution of males and females across the ATU.

Position of Respondents in the ATU: This section outlines the various positions of the respondents in this study. The positions are similar across the ATU in Ghana. In order to acknowledge the varied positions involved in this study, their various positions and frequency have been included in Table 6. It also explains their direct or indirect involvement in the management of projects in the ATU.

Table 2
Position of Respondents in the ATU

Position	Frequency	Percent
Coordinating Director	15	6.1
Planning Officer	25	10.2
Head of Works/Engineer	27	11.0
Finance Officer	23	9.4
Budget Officer	24	9.8
Town & Country Planning Officer	18	7.3
Director of Academics	12	4.9
Director of Business Unit	14	5.7
Director of Health	14	5.7
Others	73	29.8
Total	245	100.0

Table 6 depicts the positions of respondents in the study. In line with the objectives of the study, officers who were directly involved in projects in the various ATU were targeted. Out of the 245 respondents 25 of them were planning officers representing 10.2%; another 27 (11%) of them were either head of works or engineers; the finance officers were 23 representing 9.4%, and the budget officers were 24 (9.8%). The coordinating directors were 15 representing 6.1% and the category of officers with the least number who took part in this study were the directors of education (12 representing 4.9%). Participants who did not belong to the positions included in the questionnaire represented the largest number with 73 representing 29.8%. Some of the other positions of respondents in this study are head of urban roads, deputy coordinating director, procurement officer, quantity surveyor, administrative manager, deputy internal audit, head of business advisory, assistant accountant among others.

Years of Working Experience: In Table 7 the years of working experience for the respondents is displayed according to the specific ranges. This table was included to acknowledge the experience of all respondents in relation to the subject matter.

Table 3
Years of Working Experience

Years of working experience	Frequency	Percent
Below 5 years	53	21.6
5 to 10 years	104	42.4
11 to 15 years	29	11.8
16 to 20 years	19	7.8
21 to 25 years	39	15.9
Over 26 years	1	.4
Total	245	100.0

In terms of their years of experience, almost 22% of the respondents had below 5 years working experience while the majority (54%) had between 5 to 15 years of working experience. Those with 16 to 25 years working experience represented 23.7%. Only 1 respondent had over 26 years of working experience. This implies that most of the respondents had the requisite experience in order to make meaningful contributions to the discussion in this study.

Highest Level of Academic Achievement: The data in Table 8 displays the highest academic qualification of respondents in this study. The academic level of respondents has been included to determine the literacy level of respondents and their capacity to respond to the questions on the subject of study.

Table 4

Highest Level of Academic Achievement

	Frequency	Percent
Master's Degree	100	40.8
Bachelor's Degree	115	46.9
Higher National Diploma	20	8.2
Diploma	8	3.3
Others	2	.8
Total	245	100.0

Almost 47% of respondents had a minimum of a Bachelor's degree while 40.8% were having a Master's degree as their minimum academic qualification. Only 8.2% and 3.3% of the respondents had a Higher National Diploma and Diploma qualifications respectively. This suggests that a higher percentage of educated people responded to the survey.

Membership of Project Management Professional Body: In Table 9 the number of respondents who are members of a project management professional body is represented. This table was essentially added to acknowledge the number of respondents who are members of a Project Management Professional body (PMP) considering the frequency of projects in the ATU. This would help the researcher elaborate on the lapses in their project execution since the professionals and non-professionals would have different results orientation in the execution of projects.

Table 5

Membership of Project Management Professional Body

Membership of a professional body	Frequency	Percent
Yes	36	14.7
No	209	85.3
Total	245	100.0

Table 9 depicts the number of respondents who indicated that they belong to a Professional Project Management Body. Over 85% of the respondents indicated that they did not belong to any Project Management Professional Body. Only about 15% indicated they were members of a professional Project Management Body. Some of those professional bodies include Ghana Institute of Planners, Ghana Institute of Architects, Association of Coordinating Directors, and Institute of Chartered Accountant among others.

Participants Belonging to Other Professional Bodies: The number of respondents belonging to other professional bodies besides the PMP or Prince2 has been illustrated in Table 10. Besides belonging to professional project management bodies, the study wanted to know which other professional bodies respondents belonged to in order to ascertain their contribution to project execution in the ATU.

Table 6

Participants Belonging to Other Professional Bodies

	Frequency	Percent
Ghana Institute of Planners (GIP)	3	1.2
Ghana Institute of Architects (GIA)	2	.8
Association of Coordinating Directors	1	.4
National Association of Development Planners	1	.4
Institute of Chartered Accountants-Ghana (ICAG)	1	.4
GHITE/IET	1	.4
GLIS (Trainee member)	1	.4
Institute of Engineers	1	.4
Institute of Engineering and Technology	4	1.6
Chartered Institute of Administration and Management Consultants	1	.4
Engineers Association of Ghana	2	.8
Total	18	7.3

Table 10 outlines the specific professional bodies that participants in this study belonged to besides project management professional bodies specified in this study (PMP and Prince 2). Participants were required to indicate which other professional bodies they belonged to apart from professional project management bodies. From Table 10, only 18 out of the 245 belonged to other professional bodies and the remaining 227 did not belong to any professional bodies.

Cross Tabulation of Respondent's Membership and PMP Body: In Table 11 members who said they were part of a project management professional body have been cross tabulated with a specific professional project management body, which in this case was either PMP or Prince2. This table is a cross-tabulation explaining the relationship between respondents who belonged to a project management professional body and which one they specifically belonged to (PMP or Prince2).

Table 7

Cross Tabulation of Respondents' Membership and PMP Body

Membership of Project Management Professional Body
* what Project Management Professional Body

		PMP	Others	
Membership of Project Management Professional Body	Yes	1	1	2
Total		1	1	2

As indicated in Table 11, when respondents were asked which professional body they belonged to, only one (1) person out of the 36 respondents was a member of Project Management Professionals (PMP) while another person belonged to a different professional management body other than PMP. The one person who had a professional project management qualification was from a Municipal Assembly. Table 11 depicts that 243 respondents of the total 245 do not belong to any professional project management body. This indicates that most of the people responsible for project initiation, planning, execution, monitoring and control at the ATU do not have professional project management qualifications and membership. According to the PMI Today as at February 2018, there are approximately 827,960

PMP members across the globe (PMI Today, 2018). This implies that, even though the membership is increasing, the local government sector in Ghana has not utilized this resource.

4.3 Conclusions from Questionnaires

The project management practices construct consisted of about 14 indicators. An exploratory factor analysis was therefore conducted to group these indicators into factors or sub constructs thereby making the project management practices a multi-dimensional construct. Afterwards, a reliability test was conducted to test for the internal consistency of the indicators that fell under each of the extracted factors (Pallant, 2010). This was done by evaluating the values of their Cronbach alpha coefficient (Cronbach, 1951). Even though Cronbach (1951) states that the alpha values for scales measuring each factor should be above 0.7, Nunally and Bernstein (1978) however assert that, for an exploratory study, a range of 0.5 is acceptable. Thus, only factors with Cronbach alpha values above 0.6 were considered for re-specification into variables measuring a particular independent variable. The results for the re-specified variables under the four factors are displayed in Table 12.

4.3.1 Research Question 1: Why was the PMO created?

The University that is the subject of this study was formed after a Polytechnics in Ghana has converted into technical universities. The university under consideration was one of part of this universities, and it also embark on development to meet the standard of National Accreditation Board of Ghana. The business units that were acquired by the university after the upgrade did not have any project management structure or background, while the business units that were part of the previous polytechnics did have project management experience and structure; however, the previous polytechnics did not have any standardized project management language, methodology, or governance processes. Many other deficiencies and problems in the project management environment were also brought to light. The consequences of these deficiencies and problems included the following:

- Poor use of resources.
- Projects were not meeting deadlines due to slow execution rates.
- Cash flow forecasting and capital budgeting was a problem.
- The institution was unable to spend its capital budget, resulting in projects rolling over year after year.
- There was no coordination between projects or between projects and operations.
- Portfolio management was not possible, resulting in a random approach to allocating and managing capital; this put the entire organisation at risk.
- Project plans and progress were not visible, thus making strategic decision-making, integration and portfolio management very difficult or impossible.
- No due diligence was followed when executing projects, which resulted in delays, cost increases, and poor quality deliverables.
- Resource management was ad hoc, resulting in a mismatch between the resources and the number of projects that needed to be executed; this resulted in overloading project managers and slow project execution.
- The large volume of capital projects could not be executed.

Simply put, the PMO was created to solve the above problems and to address the shortcomings of the project environment that existed before the implementation of the PMO. This particular PMO was built around the guidelines given by Hill (2008.) and Boles and Hubbard (2008). When the reasons for creating this particular PMO were compared with those in the literature, it was found that all the reasons for creating a PMO according to Kerzner (2003) and Hurt and Thomas (2009) were applicable. This establishes that the problems found in the literature and those experienced in other organisations are similar to those experienced in this case.

4.3.2 Research Question 2: What functions is the PMO mandated with?

The mandate of the PMO includes the following functions:

- Implement, run, and maintain an Enterprise Project Management (EPM) system that allows all project information to be stored and displayed from a single source, so as to provide a single consolidated view of all projects.
- Ensure accurate and timely information availability and ensure project visibility, including tracking and reporting on project delivery.
- Facilitate portfolio selection, prioritisation, and optimisation.

- Recruit/select programme and project managers and other project resources.
- Provide support to programme and project managers in the form of document control and knowledge management, project cost control, resource coordination, planning and scheduling, risk management, training, and project administration.
- Train and coach programme and project managers and project teams in the methodologies and knowledge areas of project management, as well as in the systems used in the project environment.
- Set up temporary programme and project offices where required.
- Serve as CoEs that provide relevant methodologies, standards, templates, and tools.
- Provide integrated governance across programmes and projects.
- Perform health checks on programmes and projects when required by the Executive Committee; this includes project auditing and recovery of projects that are at risk.
- Ensure due diligence on the execution of projects and programmes.

When these functions are compared with those found in the literature, it can be seen that not all of the functions indicated in the literature are applicable to this PMO. This supports the notion that each organisation has its own needs and problems that need to be solved, and will mandate its PMO to solve its specific problems. There is no generic, one-size-fits-all set of functions for a PMO, even though there are overlaps and a number of generic functions.

4.3.3 Research Question 3: What impact is the PMO perceived to have on the organisation?

The establishment of this PMO brought about significant changes in the organisation. One of the biggest changes was the implementation of a specified project management methodology and governance. A standardised project life cycle process (PLP) was also established, which was developed for industry best practices and dictates the lifecycle and gate review process.An EPM system was implemented to support this methodology and the entire project managing environment. This system provides the necessary tools to everyone involved in projects to function according to the methodology and governance. This system supports all the functions of the PMO, and is linked to other enterprise software to form an integrated enterprise system. According to the managers who were interviewed, one of the biggest advantages and attributes of the PMO is the visibility of project plans, progress, and tracking of projects. Due to the standardised project reporting systems, accurate project information is available from the system, allowing for better decision-making and coordination between projects. With the implementation of the PMO also came the tools and methodologies to support project portfolio management.

A new project management process was developed and implemented. Since the implementation of the PMO, there are now specialist project managers; no longer do engineers alone have to do both project management and engineering. Other specialist functions are also now included in the project support roles, such as planning and scheduling, construction supervision, document control, cost control, and resource coordination. Before, projects were executed in isolation with very little coordination. The effects of one project on another were not taken into consideration. Currently, there is better coordination and integration between projects. The effects of one project on another, and the effects on future expansions are being considered. Interfaces between projects and between projects and operations are better defined and managed. One of the functions of the PMO is to conduct project audits. If projects are found to be noncompliant, the situation must be rectified within a certain period of time. If a project is found to be severely behind schedule or if major deficiencies are found, the PMO can assist in recovering the project and getting it back on track and up to standard. It seems that the PMO had a dramatic effect on the project management maturity of the organisation. There might be other factors that influenced the project management maturity, but the establishment of the PMO was the only significant change that took place within the project management environment of the organisation. Based on the comparison of the OPM3® surveys that were done in 2010 (before the PMO) and in 2014 (after the PMO), the overall organisational project management maturity has increased from 22 per cent to 44 per cent, while the project management maturity has increased from 24 per cent to 69 per cent.

All 39 best practices for project management were achieved, compared with only four in 2010. Programme management maturity has increased from 0 per cent to 22 per cent and portfolio management maturity from 10 per cent to 18 per cent. The organisational enablers improved from 53 per cent to 76 per cent. No explanation for this improvement in maturity, other than the implementation and work done by the PMO, could be found. A KPI that is used to measure the performance of the portfolio of projects of this company is ‘capital spending accuracy’. It is the actual capital expenditure expressed as a percentage of the capital budgeted for a given year. This KPI showed a significant improvement since the implementation of the PMO. It improved from an average of 50 per cent to 81 per

cent in the year that the PMO was established. The following year, a 90 per cent spending accuracy was achieved. The improvement of this KPI indicates an improved ability of the company to execute its projects.

The improvements and the problems that were solved by the PMO include the following:

- Better use of resources.
- There are specialist project management and support functions.
- There are methodologies and governance processes in place.
- Better coordination and integration. There are specific forums for the coordination and integration of projects.
- There is better project planning and risk management.
- Project plans and progress are visible.
- Portfolio management is made possible.
- Sufficient data is available to pair a project manager with a suitable project.
- There is a project repository for all project-related information, including lessons learned.

Establishing a PMO also had several negative impacts. The biggest negative impact was the increase in cost. The cost of the PMO is allocated to individual projects so that the cost of the PMO can be capitalised. This extra project management cost allocated to each project made some smaller projects less economically viable. Another problem that was encountered and that persists two years after implementation is the resistance to change. The new methodologies and governance processes are not easily adopted. Some inter-departmental tension and culture clashes are also caused by the new methodologies and governance processes. This is very similar to the problems described by Pellegrinelli and Garagna (2009), where the functions and 'powers' of the PMO led to internal political problems.

4.3.4 Research Question 4: How does the PMO & PPM fulfil its purpose?

Comparing the problems that were encountered before the implementation of the PMO and the problems that were actually solved, it is clear that the PMO does fulfil its purpose. The general consensus among interviewees also confirmed that the PMO does fulfil its purpose, but that it has not yet reached its full potential. The reasons for this are that the PMO is severely understaffed, the PMO skill level of personnel is not up to standard yet, not all support functions are available because the PMO is still in a growing phase, and resistance to change is hampering progress.

4.3.5 Research Question 5: What value is added by the PMO & PPMO?

Various problems were present in the project management environment before the implementation of the PMO. The PMO was, among other reasons, created to solve these problems. It was found that after the implementation of the PMO, most of these problems had been solved or partially solved. With the implementation of the PMO came various new systems, tools, and procedures that enabled the organisation to manage its portfolio of projects better. The biggest contributions were the visibility of project plans and progress, the ability to forecast project spending and benefits over a number of years, and the ability to align projects with the business strategy. With the establishment of the PMO also came various forums that are specifically aimed at project integration and coordination. The coordination between projects resulted in large savings in capital. The establishment of the PMO significantly increased the project management maturity of the organisation. According to Saures, cited in Skulmoski (2002), increased maturity indicates the increased importance of project management to an organisation. Even though an increase in maturity will not guarantee project success, it should improve the chances of project success. It is also an indication of an increase in the number of support systems that are in place to aid a project.

According to Anderson and Jessen (2002), increased maturity means that an organisation is in a better position to use projects to reach its goals. The PMO drastically improved the organisation's ability to execute its capital projects and improve its capital budgeting and spending accuracy.

4.4 Analysis of the Interviews

By answering the research questions, the different fields can be populated. Displaying the results of the research in this format shows the value of each function. However, it must be realised that no single function can truly add value in isolation from the other functions. For instance, the tools and systems will be useless unless they are combined with the methodologies or the support functions to run this system. Similarly, the methodologies cannot add value without the systems and project support functions to support its implementation. Each function on its own can

add value, but the true value of the PMO lies in the synergy between the functions. In this specific case, the improvement in the capital spending accuracy is not the result of one specific function. It is the synergy between all the functions that contributed to this value.

5.0 CONCLUSION

The PMO studied had a dramatic effect on the organisation. Many systems and methodologies were put in place at one time with noticeable effects on the organisation. Although the true potential of this PMO has not been reached yet, the PMO is perceived to add value overall. This study indicates three new ways that can be considered to determine the value of a PMO.

5.1 Findings

First, the value of a PMO starts with the reasons for creating the PMO. If it was created for a specific purpose and it fulfils that purpose, then it does add value. In this case, the PMO was to a large extent created to solve certain problems. It was found that the majority of these problems were in fact solved or at least partly solved.

A second way of determining the value of the PMO is to determine the value of the capabilities that the PMO provides to the organisation. In this particular case, the PMO gave the organisation the ability to manage a project portfolio. This specific ability is also not fully used yet, but it has already been of great value to the organisation. This can be seen in the increased coordination and integration of projects and the number of strategic projects in the pipeline. The ability to allocate capital to support the organisation's strategy is further proof of this ability. Amongst the functions of the PMO is the establishment and maintenance of project management support systems, including methodologies, tools, and techniques. This function of the PMO directly influences the project management maturity of the organisation. The value of the PMO lies in the continuous improvement of the maturity level of the organisation. A higher maturity level means that the organisation is more supportive of its projects and there is a larger chance of success. In this case, a marked increase in maturity was determined during the period that the PMO was established.

A third way of determining the value of the PMO, in a more quantitative way, is to measure the improvement of specific KPIs that are used to measure the performance of the portfolio of projects. For this particular case, the performance of the project portfolio or the organisation's ability to execute its projects was measured by the accuracy of predicting capital spending. With the implementation of the PMO, this KPI performance measure drastically improved.

5.2 Recommendations

Hobbs and Aubry (2007) indicate that a large number of PMOs are closed down within a short period of time after their establishment. This gives rise to the criticism that PMOs are not sustainable. It is thus recommended that the sustainability of the PMO that was studied be evaluated from time to time to determine whether this criticism applies to this PMO. The impact of this PMO should be re-evaluated in a number of years to determine whether it does in fact reach its full envisaged potential. The evolution of the PMO should also be studied as the needs of the company change. This is likely to confirm the comments made by Pellegrinelli and Garagna (2009) about the need for a PMO to keep evolving in order to remain viable and to continue to add value. The relationship between the different PMOs of the hosting organisation can be studied to determine its impact on the project environment of the organisation. The relational typologies and relationships described by Müller et al. (2013) can be studied and applied to this case. One of the functions of the PMO is to establish and maintain standardised methodologies in an organisation. The problem of having standardised and very strict methodologies, however, is that it takes away the autonomy of the project manager and might actually become a burden instead of a support.

5.3 Further Research Study

Further research is required on the correct balance of standardisation and flexibility of methodologies. The findings of this research should be applied to different cases to test their validity and applicability. The conceptual model used can also be applied to other cases to test its usefulness in aiding in the thinking process to determine the value or impact of a PMO.

5.4 Conclusion

This study supports the proposition that there are more ways of determining the value of a PMO than merely considering the direct financial implications. It further illustrates that the value of a PMO can be determined by analysing the impact that the PMO has on an organisation, and that the value of the PMO can be linked to its functions. The value of the PMO studied lies in the impact it had on the organisation and the changes it brought about. The impact this PMO had on the organisation includes solving specific problems, giving the organisation the ability to do portfolio management, improving integration and coordination in the project environment, and improving project management maturity. One of the biggest changes that were brought about was the improvement in a specific KPI that is used to measure the performance of the company's project portfolio and its ability to execute its projects. A conceptual model was devised and used to link the functions of the PMO with the value created. An observation that was made from using this model is that the value of the PMO results from the synergy between the functions.

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