UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL
(UCI)

TO DEVELOP A PROJECT MANAGEMENT OFFICE (PMO) PROPOSAL FOR THE ENGINEERING DEPARTMENT OF THE SAINT LUCIA AIR AND SEA PORTS AUTHORITY (SLASPA).

SAYDIA CHARLES

FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE
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This Final Graduation Project was approved by the University as partial fulfillment of the requirements to opt for the Master in Project Management (MPM) Degree

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DEDICATION

This research paper is dedicated to my deceased father, Dr. Augustin Charles, who was a philosopher in his own realm and was a strong advocate of continuous self-development through academia, and to my son whom I believe will continue the fruitful family legacy.

ACKNOWLEDGMENTS

First and foremost, thank you God for this journey, for you have never failed me yet.

Words cannot express my gratitude for my loving family and I say thank you for everything and always being there for me through this process, especially my brother Jason.

I would also like to thank my thesis tutor Engineer Alberto Redondo Salas of the Global School of Project Management (UCI), for guiding me through this research.

To team SLASPA thanks for your time, support and understanding.

INDEX OF CONTENTS

INDEX OF FIGURES

INDEX OF CHARTS

ABBREVIATIONS AND ACRONYMS

- CSP: Port Castries, St. Lucia
- GFLC: George F.L. Charles Airport
- FGP: Final Graduation Project
- KPI's: Key Performance Indicators
- NDB: Non-Directional Beacon
- PM: Project Management
- PMO: Project Management Office
- PMCoE: Project Management Centre of Excellence
- PSO: Project Support Organization
- SLASPA: Saint Lucia Air and Sea Ports Authority
- VOR/DME: Very high frequency omni-directional range with a distance measuring equipment radio beacon
- WBS: Work Breakdown Structure

EXECUTIVE SUMMARY (ABSTRACT)

The Saint Lucia Air and Sea Ports Authority (SLASPA) was established by an Act of Parliament, No. 10 of 1983. This Act brought together the Civil Aviation Department of the Ministry of Communications and Works and the Port Authority. SLASPA is responsible for managing and providing a high level of quality service at the main ports of entry to the island including two principal seaports, Castries and Vieux Fort, and the George F.L. Charles and Hewanorra International Airports, as well as the smaller points of entry: Soufriere, Marigot, and Rodney Bay Marina. SLASPA has a unique position for the island by providing avenues to generate initiatives for maximizing the assets held in its name and to offer value-added services to its clientele. SLASPA is managed by a team of professionals headed by a General Manager, and reports to the Board of Directors.

The challenge that we currently face is that of ageing infrastructure as SLASPA's major air and sea ports were built in the 70s and 80s. The Engineering Department is required to execute an increasing number of projects upon request from SLASPA's stakeholders. Further, there is also an increasingly consistent demand for major maintenance projects and capital projects primarily due to a majority of SLASPA's facilities being close to the end of their useful life cycle or at the end of it. Currently, the same team that manages maintenance is also responsible for the management and implementation of projects.

The Engineering Department in the absence of a PMO has resulted in a low rate of project implementation. Over the past years and as is with many cases, few performance indicators are utilized which results in the lack of project implementation. Low rate of project implementation has resulted in projects repeatedly being rolled over to the next financial year. The purpose of this case study is to analyze the existing organizational structure of SLASPA's Engineering Department to successfully manage and implement projects prior to the problems stated above. Hence, the intention is to develop a feasible PMO proposal that is suitable for the Engineering Department mandate.

The Final Graduation Project (FGP) general objective was to develop a Project Management Office (PMO) proposal for the Engineering Department of the Saint Lucia Air and Sea Ports Authority (SLASPA). The specific objectives were to assess the needs of the Engineering Department, to determine its project management strategy, strengths, weaknesses and areas of improvement, to analyze the different PMO types and select the best option for the department, to determine the strategic purpose of the PMO, and lastly to develop the scope of the PMO for the Engineering Department.

For the purpose of this FGP, the types of information sources that were used are primary and secondary namely SLASPA archives, personal experiences, the PMBOK Guide, literature reviews, internet, documentaries and academic journals. Information sources can also be printed or presented in an electronic format. The research methods used were primarily analytic-synthetic, deductive–inductive and observation. The research tools utilized were the six sigma maturity assessment model, Meetings, Expert judgment, Stakeholders consultation, and expert's advice.

This FGP assumptions and constraints were also highlighted, along with its deliverables.

The results of the analytical method propelled the analysis of the different types of PMOs in order to determine the best suitable for the SLASPA Engineering Department‘s development. The maturity assessment results highlighted the Engineering Department strengths and weaknesses in certain project management areas, including leadership alignment, leadership approach to lean six sigma, approach to errors and partial training for employees. Upon the analysis of the three basic types of PMOs, it was concluded that a Hybrid of supporting and controlling PMO was most suitable at this time.

Conclusion to the main objective of this research was that a PMO was necessary and should be developed to maximize the rate of project implementation on the Engineering Department.

Given the results of this research, it was recommended that the Engineering Department implement a PMO to its organizational structure to optimize the results of successful future projects; Upon the implementation of the new PMO, an annual review program should be established to assess the needs of the PMO, its project management strategy, as well as strengths, weaknesses and areas of improvement. A maturity assessment should be conducted at least every three years to update the status of the Engineering Department, and a routine review program annually to analyze the relevance of the PMO, and to advise key stakeholders if and when the PMO would be better served with another PMO type.

1. INTRODUCTION

The Saint Lucia Air and Sea Ports Authority (SLASPA) was established by an Act of Parliament, No. 10 of 1983. This Act brought together the Civil Aviation Department of the Ministry of Communications and Works and the Port Authority. SLASPA is responsible for running the island's principal seaports, Castries and Vieux Fort, as well as the island's two airports, George FL Charles and Hewanorra International Airports. SLASPA also has regulatory oversight of the country's other points of entry: Soufriere, Marigot and Rodney Bay Marina. Operating from its headquarters in Castries, SLASPA has a unique position for the island by providing avenues to generate initiatives for maximizing the assets held in its name and to offer value-added services to its clientele. SLASPA is managed by a team of professionals headed by a General Manager who reports to the Council, which is comprised of ten (10) persons appointed by Government.

In 1994, just over a decade after the organization was founded, SLASPA's portfolio expanded by Shipping Act No. 11, which gave them the mandate to establish and house a Maritime Affairs Unit dedicated to licensing ships and taking care of matters relating to the safety of crew at sea. As the nineties continued SLASPA further extended their operations with the construction of La Place Carenage, a duty-free shopping mall that featured a mix of shopping, dining and entertainment overlooking Queen Elizabeth II Dock and the Castries Waterfront. The facility was further expanded in 2004.

SLASPA is also responsible for the island's lighthouses, the Moule A Chique and Vigie Lighthouses. The Vigie Lighthouse boasts a 360-degree view of the north side of the Island and its surroundings, while Moule A Chique is reported to be the second-highest lighthouse in the world.

To date, SLASPA's work involves handling roughly 600,000 tonnes of cargo and helping over 800,000 passengers get to their destination every year. 400,000 aircraft land safely under SLASPA's careful watch, as do over 1,000 seagoing vessels.

Given the significance of their role, SLASPA has consistently invested in service delivery for the last few years to ensure their ports of entry are well managed and up to date. These investments include improving technology to provide operational efficiencies, acquiring extra cargo handling equipment to build capacity, reconfiguring their cargo shed to improve delivery speeds, and upgrading their facilities for passengers at airports and ferry terminals alike to ensure people coming to the island for business or pleasure are met with comfort.

The Engineering Department is one of the most critical departments within SLASPA primarily because it is responsible for overseeing and ensuring a high level of efficient technical engineering competencies throughout its facilities, in the pursuit of the numerous port infrastructural developments. More Specifically, the Engineering Department is responsible for:

- Providing design, preventative and emergency maintenance, advice on equipment replacement;
- Managing the procurement process for both new and replacement of physical assets;
- Managing SLASPA's electricity use, project management, procurement and other related services in the fields of mechanical (inclusive of air conditioning), electrical, civil and building engineering, all in an effective manner for the Authority, whilst ensuring customer satisfaction.

The challenge that we currently face is that of ageing infrastructure as most of SLASPA major airport and seaports were built in the 70s and 80s. Thus, strategic business decisions and solutions have to be made to allow SLASPA to modernise and maintain the facilities. At SLASPA, more so its Engineering Department, the absence of a Project Management Office (PMO) within such a dynamic and demanding organization has resulted in a low rate of project implementation.

The overall objective of the Engineering Department is “To provide design, maintenance, project management and other related services in the fields of Mechanical, Electrical, Civil and Building Engineering, in an efficient and cost-effective manner”. As such, the overall strategic & tactical Engineering Departmental objectives are tailored to be in line with SLASPA’s organizational operational plan for the triannual period 2017-2020. Hence, for the purpose of this study, the primary objective of focus for the above triannual is to implement at least 90% of priority 1 capital projects, ensuring that projects are completed on time, within budget and to specifications.

The Engineering Department has been required to execute an increasingly number of projects upon request from SLASPA’s internal stakeholders for the last couple of years. Additionally, the above mentioned KPI is the measurement used to track the Engineering Department’s progress toward SLASPA’s strategic operational goals and revealed that the performance for the Engineering Department was below 40% project implementation for each respective year, 2017-2020. Noteworthy, during 2017-2020 majority of projects continue to be rolled out with a large number of these projects were upgrades and refurbishment to existing assets. Further, the fact that health and safety concerns arose during the 2017-2020 triannual which required resources to be redirected in a number of cases. Indoor environment quality issues also created a situation where the maintenance team was unable to attend to capital projects, as this team was required to work through the nights to resolve issues that were raised. Consequently, facility managers continue to face increasing pressure to prioritize the direction of limited resources to address maintenance and capital needs of SLASPA’s aged assets.

With the above highlighted, there is an increasingly constant demand for major maintenance projects and capital projects primarily due to the majority of SLASPA's facilities being at the end of their useful life cycle or close to the end of it. Currently, the same team which manages maintenance is also responsible for the management and implementation of projects.

As a result of the absence of a PMO, The Engineering Department has seen a low rate of project implementation. Over the past years and as is with many cases, few performance indicators are utilized which results in the lack of project implementation. The low rate of project implementation has resulted in projects repeatedly being rolled over to the next financial year.

Aside from the type of PMO the Engineering Department requires, it is also proposed to implement standardizing project management processes. Subsequently, the PMO will become the unit for the management and documentation of projects as it pertains to its successful implementation within the organization.

The purpose of this case study is to analyze the existing organizational structure of SLASPA's Engineering Department to successfully manage and implement projects as it pertains to the problems stated above. Hence, the intention is to develop a feasible PMO proposal that is suitable for the Engineering Department mandate.

The PMO will align their objectives and functions with the organization's needs and prioritizations in order to achieve expected mutual benefits and efficiency. The expected general benefit is to obtain by this research a proposed type of PMO to be developed that will allow for a high rate of project implementation for the organization.

To develop a Project Management Office (PMO) proposal for the Engineering Department of the Saint Lucia Air and Sea Ports Authority (SLASPA).

- To assess the needs of the Engineering Department, to determine its project management strategy, as well as strengths, weaknesses and areas of improvement.
- To analyze the different PMO types and select the best option for the department.

- To determine the strategic purpose of the PMO.
- To develop the scope of the PMO for the Engineering Department.

2. THEORETICAL FRAMEWORK

SLASPA is a subsidiary of the government of Saint Lucia through an Act of Parliament and is primarily responsible for the management of the main ports of entry into the island along with having jurisdiction over some of the main designated bays which receive yachts.

This research is conducted in Saint Lucia using SLASPA's Engineering Department as the pilot case study.
SLASPA's management of these ports, both air and sea, operated by one Authority, has allowed Saint Lucia to establish a unique position to provide avenues to generate initiatives that maximizes the assets held in its name through efficiencies that would be impossible otherwise. SLASPA is unique in that not many air and seaports are managed under one Authority: in different parts of the world the airports and seaports authorities are managed separately, either privately or by governments. SLASPA's uniqueness lies in being able to have efficiencies in its management structures and operations by merging those two organizations under one umbrella.

The Engineering Department's overall responsibility is to oversee and ensure a high level of efficient technical engineering competencies throughout SLASPA's facilities. The Engineering Department hence provides the above services to the following facilities, namely:

- George F. L. Charles Airport – Terminal Building, pavements, fencing and grounds, equipment (tractors), airfield and ground lighting systems, electrical systems, gensets;
- Port Castries (inclusive of La Place Carenage) – Equipment (cranes, forklifts, reach stackers, trucks, etc.), electrical systems, Berths, Buildings, pavements, sea bed, gensets, navigational buoys and fencing;

- Hewanorra International Airport – Terminal Building, pavements, fencing and grounds, equipment (constant current regulators, tractors, front end loaders), airfield and ground lighting systems, electrical systems, gensets;

- Port Vieux Fort – Equipment (cranes, straddle carriers, reach stackers, forklifts, etc), Berths, Buildings, pavements, sea bed, navigational buoys, electrical systems and fencing;

- Lighthouses at Vigie and Moule-a-Chique – Buildings and grounds, electrical systems and gensets;

- NDB Site – Buildings and grounds, electrical systems, gensets;

- VOR/DME Site – Buildings and grounds, electrical and air conditioning systems, gensets;

- Aircraft Navigational Beacons and Seaport Navigational Markers at strategic locations on the island;

- Telecommunication Systems – Base stations, portables, mobile units, towers and equipment

Mission :

To facilitate trade and travel through value creation in a safe, secure and customer-centric environment for sustained social and economic development.

Vision:

To be a modern gateway connecting people, partners and the world.

SLASPA is managed by a team of professionals headed by a General Manager with the Engineering Department being one of its core departments. The Engineering Department is headed by the Chief Engineer.

Figure 1, 2, 3 and 4 highlights the Engineering Department's current organizational structure that exist.

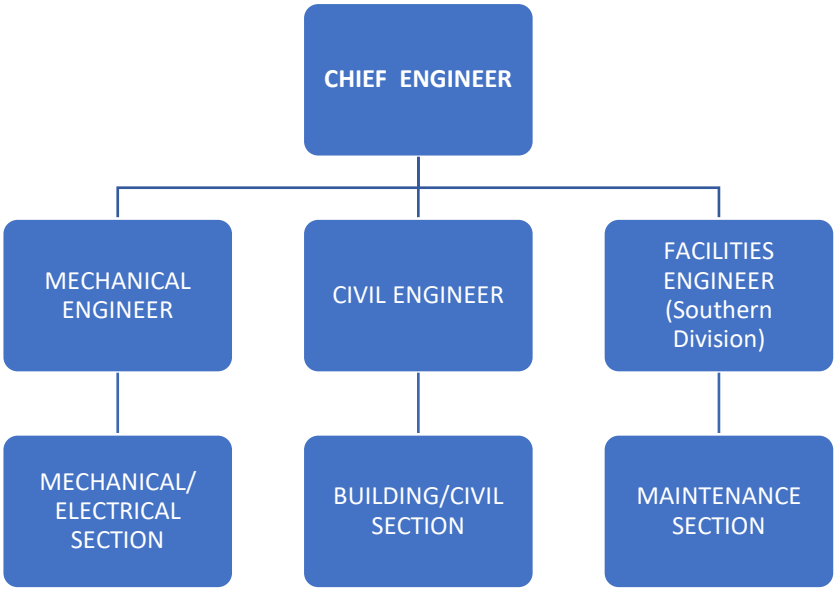

Figure 1. Engineering Department Organizational structure (SLASPA Achieve 2018)

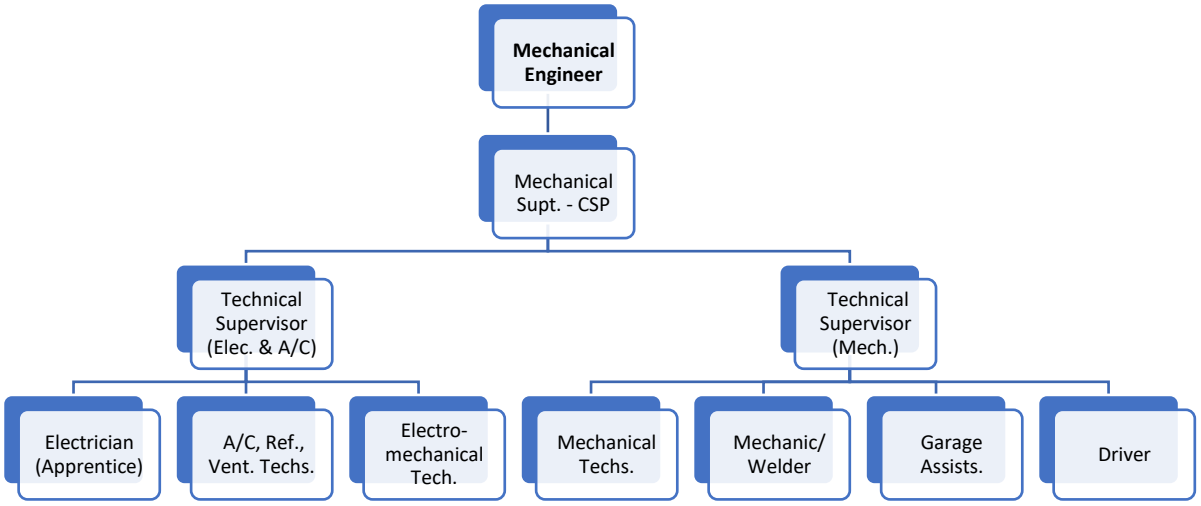

Figure 2. Engineering Department – Mechanical, Electrical Section Organizational structure (SLASPA Achieve 2018)

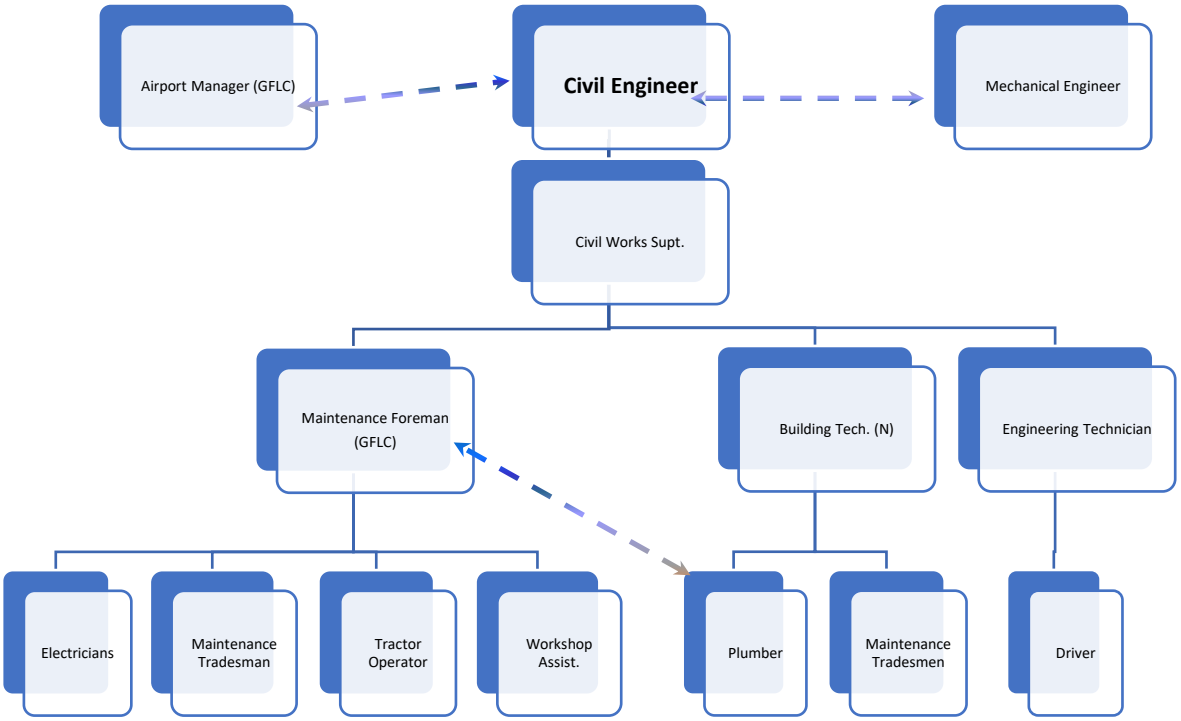

Figure 3. Engineering Department – Building/ Civil Section Organizational structure (SLASPA Achieve 2018)

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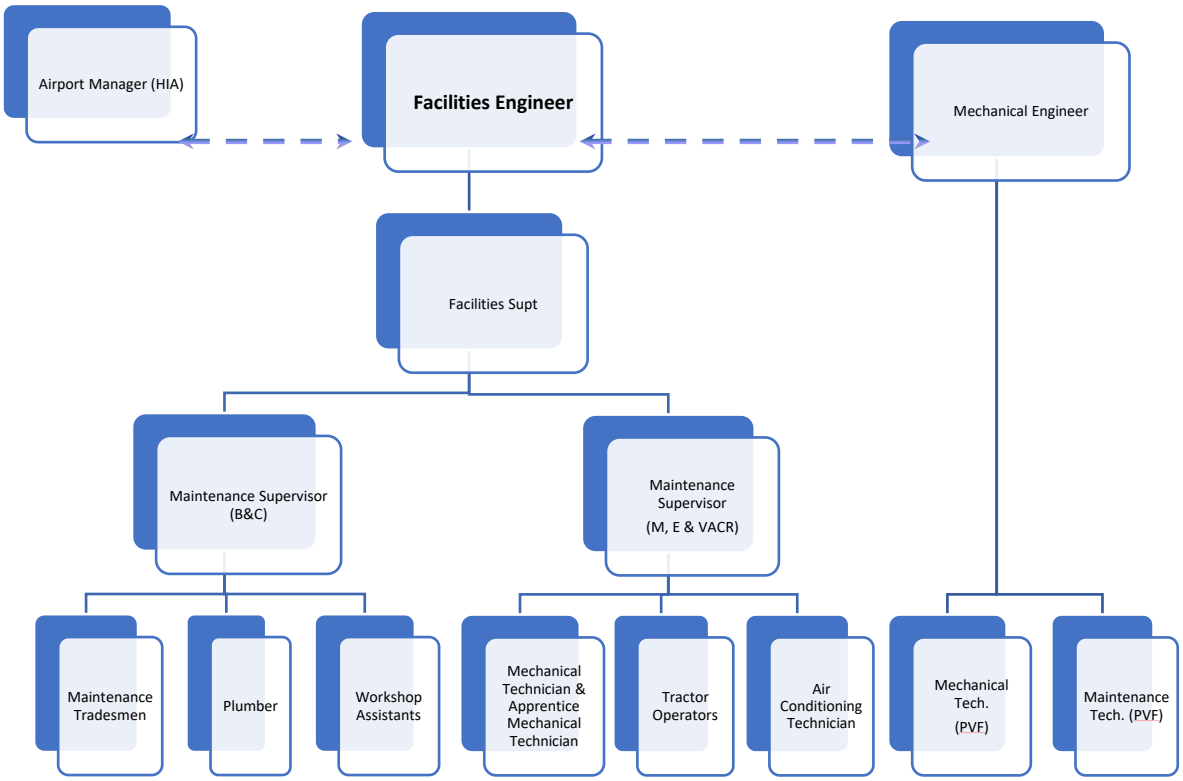

Figure 4. Engineering Department – Maintenance Section – Southern Division Organizational structure (SLASPA Achieve 2018)

SLASPA's Engineering Department is responsible for a wide portfolio of works across the organization. This ranges from the provision of full project management services, including project planning to project close out, as well as consulting services in air conditioning, electrical systems and civil engineering. The primary objective of the Engineering Department is to provide the highest quality service in maintenance, design and construction of all SLASPA's assets; buildings, berthing structures, civil infrastructure, electrical, mechanical, navigational plant and equipment; in the most efficient and economical manner. The Department is also heavily involved in procurement of goods and services, and contract management.

The objective of this research is to develop a Project Management Office (PMO) proposal for the Engineering Department using the main project management concepts. These project management concepts, such as project management,

project life cycle, knowledge areas, project management processes, process groups, and any other applicable project management related concepts will foster better management and operational systems to capitalize on the project implementation in the engineering department.

The Project Management Body of Knowledge (PMBOK Guide) Sixth Edition defines " A project is a temporary endeavor undertaken to create a unique product, service, or result." (PMBOK Guide, 2017, p.4). Hence, there is one important term that must be coated in the aforementioned definition, that is:

- "**Projects drive change**. Projects drive change in organizations. From a business perspective, a project is aimed at moving an organization from one state to another state in order to achieve a specific objective (see Figure 6). Before the project begins, the organization is commonly referred to as being in the current state. The desired result of the change driven by the project is described as the future state.

For some projects, this may involve creating a transition state where multiple steps are made along a continuum to achieve the future state. The successful completion of a project results in the organization moving to the future state and achieving the specific objective."(PMBOK Guide, 2017, p.6).

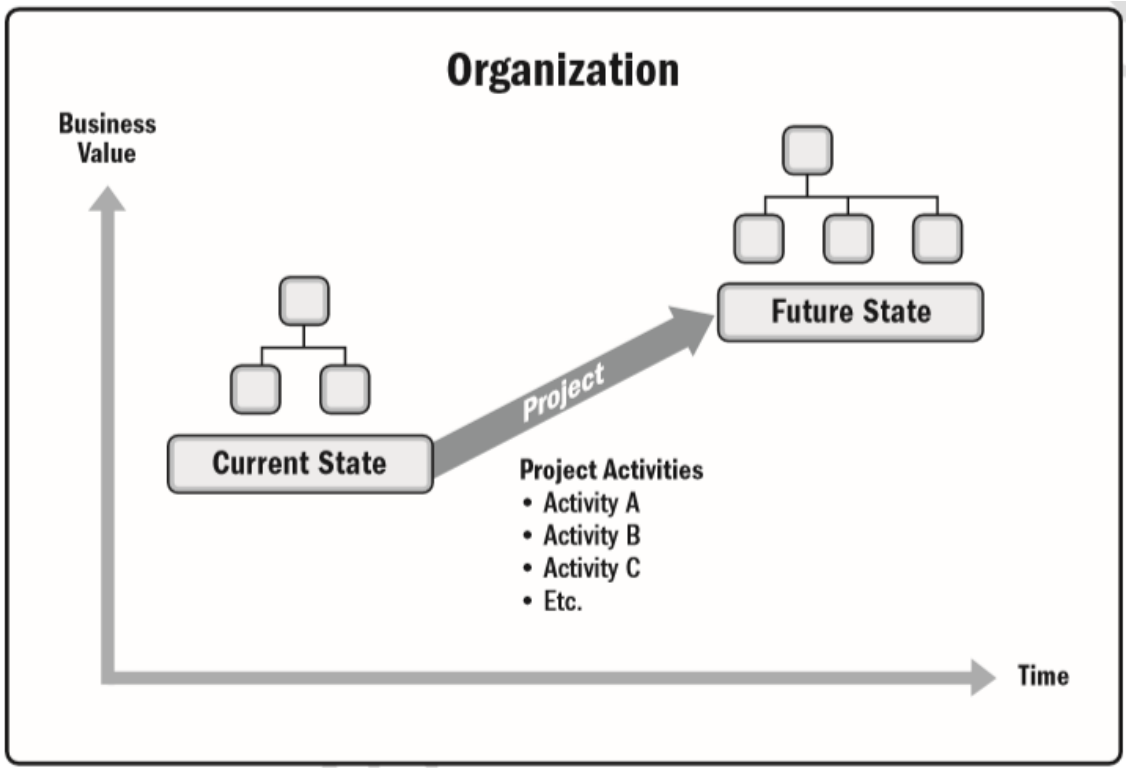

Figure 5. Organizational State Transition via a Project (PMI, 2017, p.6)

Hence, for the purposes of this research, the project shall be to develop a Project Management Office (PMO) proposal for the Engineering Department of SLASPA.

“A project life cycle is the series of phases that a project passes through from its start to its completion. It provides the basic framework for managing the project. This basic framework applies regardless of the specific project work involved. The phases may be sequential, iterative, or overlapping.” (PMBOK Guide, 2017, p.547). Projects vary in size and complexity with a generic life cycle structure as following, which is also shown in Figure 6.

- Starting the project,
- Organizing and preparing,
- Carrying out the work,
- Closing the project

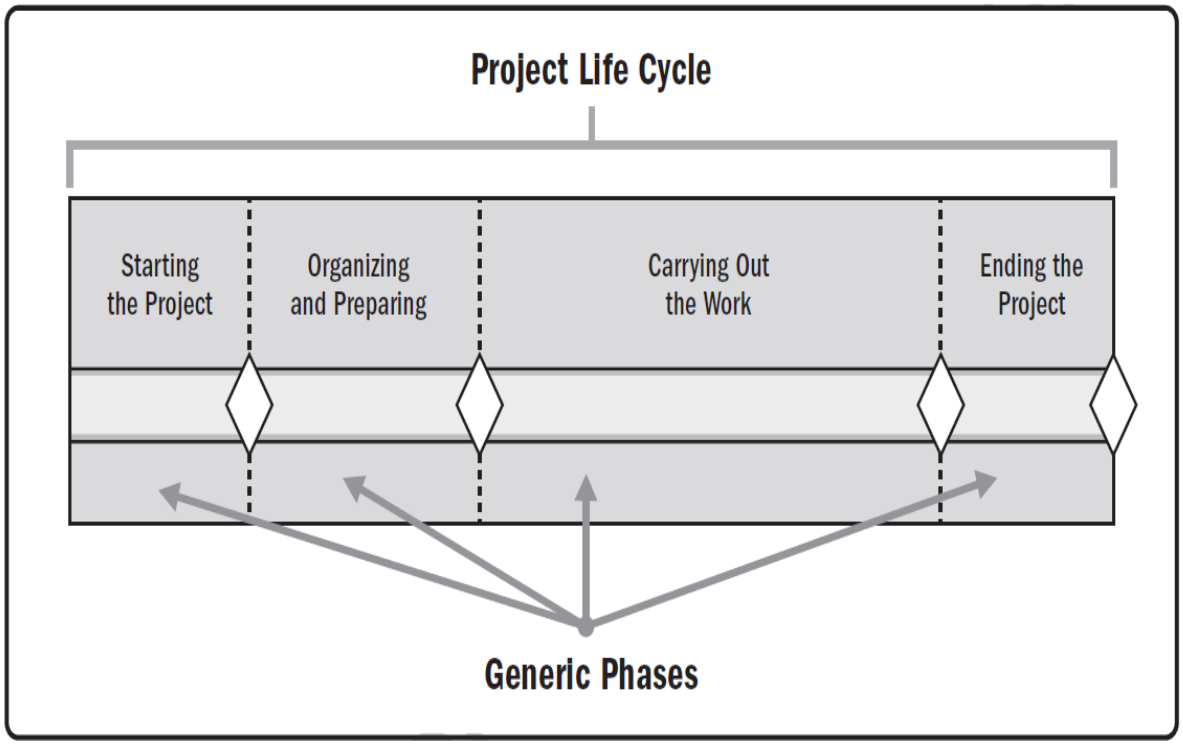

Figure 6. Generic project life-cycle (PMI, 2017, p. 458)

“The project life cycle is managed by executing a series of project management activities known as project management processes. Every project management process produces one or more outputs from one or more inputs by using appropriate project management tools and techniques. The output can be a deliverable or an outcome. Outcomes are an end result of a process.”(PMI, 2017, p.22).

“Project management is accomplished through the appropriate application and integration of logically grouped project management processes. While there are different ways of grouping processes, the PMBOK Guide groups processes into five categories called Process Groups.” (PMBOK Guide, 2017, p.22)

The book A Guide to the Project Management Body of Knowledge (PMBOK Guide, 2017) further explains that :

“A Project Management Process Group is a logical grouping of project management processes to achieve specific project objectives. Process Groups

are independent of project phases. Project management processes are grouped into the following five Project Management Process Groups:

1. **Initiating Process Group.** Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
2. **Planning Process Group.** Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
3. **Executing Process Group.** Those processes performed to complete the work defined in the project management plan to satisfy the project requirements.
4. **Monitoring and Controlling Process Group.** Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
5. **Closing Process Group.** Those processes performed to formally complete or close the project, phase, or contract." (p.23)

Figure 7 illustrates the generic Project Management Process.

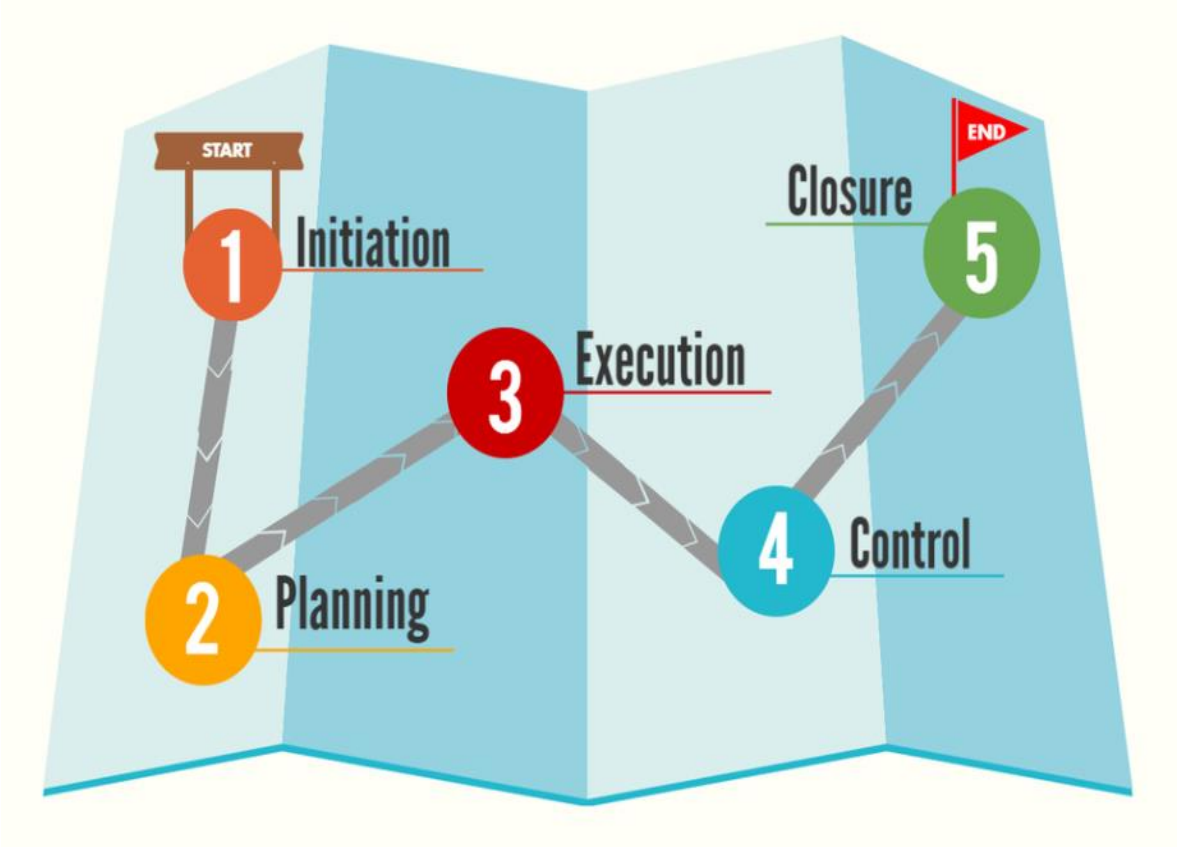

Figure 7. Generic project management processes (Panico & Tremel, 2016)

“Process Groups are not project phases. If the project is divided into phases, the processes in the Process Groups interact within each phase.” (PMBOK Guide, 2017, p.555) The process groups interact over the project life cycle and it is possible that all process groups can be represented within a phase as is illustrated in Figure 7.

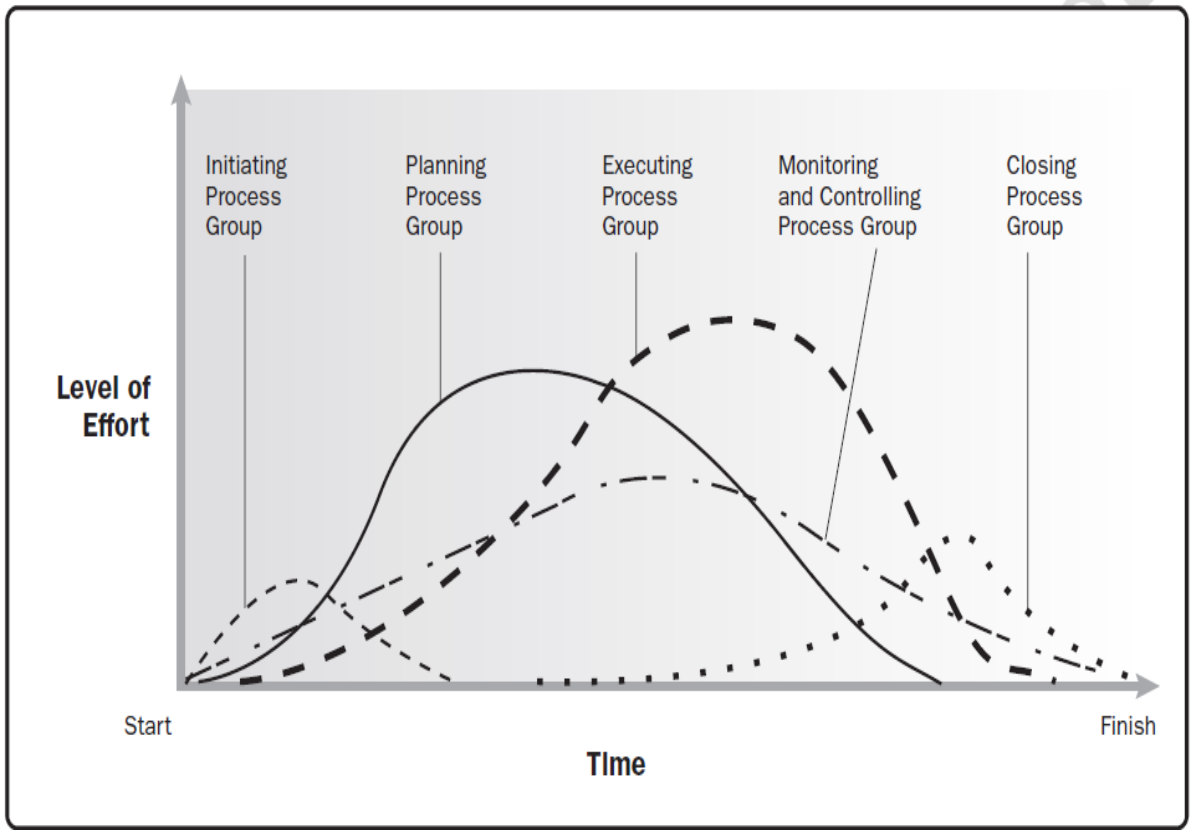

Figure 8. Typical Process Group Interactions Within a Project or Phase (PMI, 2017, p.555)

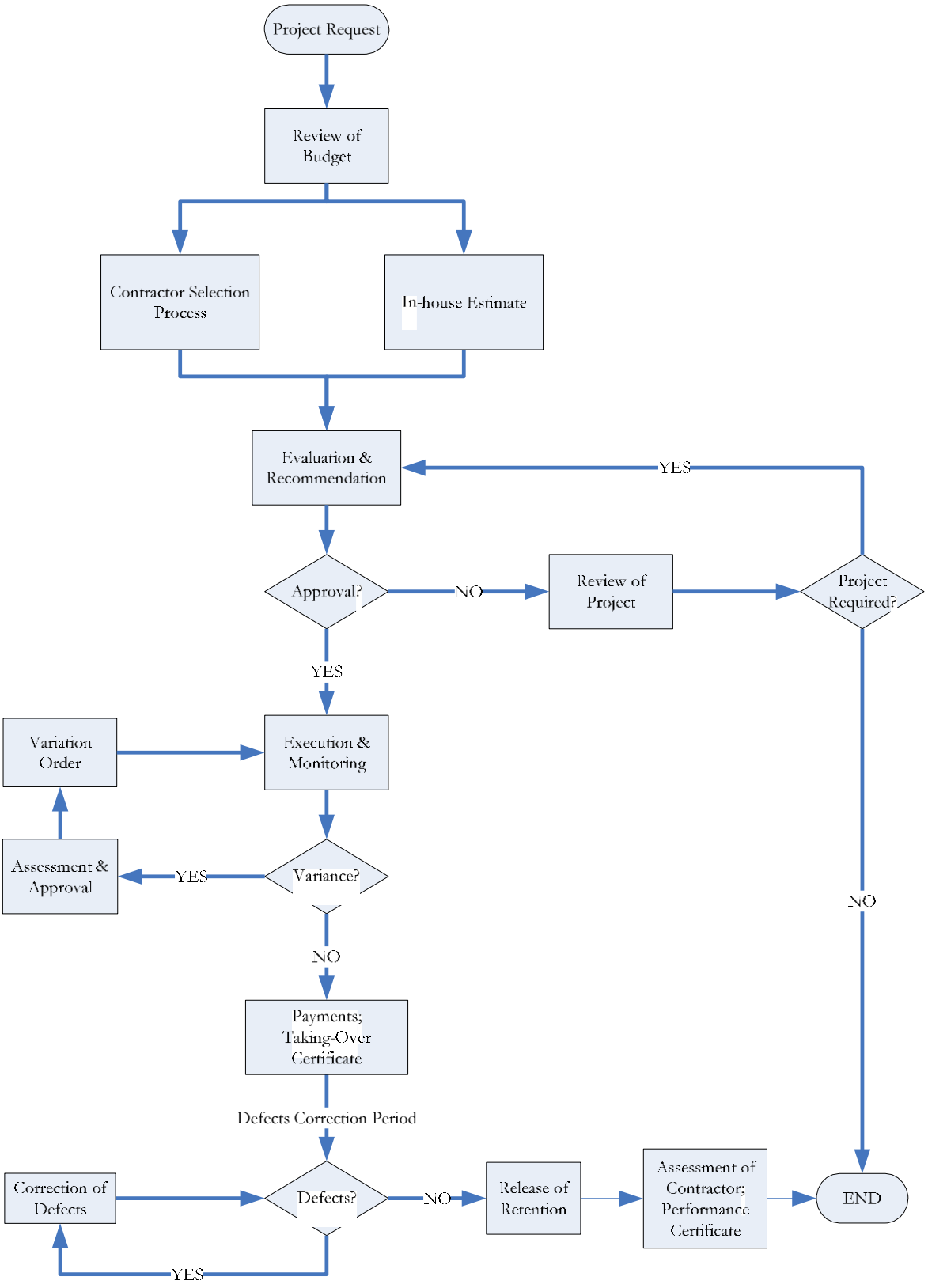

Figure 9 The Engineering Department's Existing Project Management Processes (Procedures for Project Implementation – Engineering Department 2008)

For the purpose of this research paper for the proposed PMO proposal, better-quality structured project management processes will be developed for the Engineering Department as a core unit within SLASPA to assist with better implementation and management of its projects, as it already has an existing project life-cycle, as is illustrated in Figure 9. This proposed project life cycle for the Engineering Department will include the following:

1. Initiation Process
2. Planning Process
3. Execution Process
4. Monitoring & Control Process
5. Closing Process

The PMBOK Guide (2017) states that:

> “In addition to Process Groups, processes are also categorized by Knowledge Areas. A Knowledge Area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques.
>
> Although the Knowledge Areas are interrelated, they are defined separately from the project management perspective. The ten Knowledge Areas identified in this guide are used in most projects most of the time. The ten Knowledge Areas described in this guide are:
>
> **Project Integration Management.** Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.

Project Scope Management. Includes the processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully.

Project Schedule Management. Includes the processes required to manage the timely completion of the project.

Project Cost Management. Includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.

Project Quality Management. Includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.

Project Resource Management. Includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.

Project Communications Management. Includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.

Project Risk Management. Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.

Project Procurement Management. Includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

Project Stakeholder Management. Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution. The needs of a specific project may require one or more additional Knowledge Areas, for example, construction may require financial management or safety and health management.(p.23, 24)

According to A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Fifth Edition, “the project management office (PMO) is an organizational structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools and techniques. The responsibilities of a PMO can range from providing project management support to being responsible for the direct management of one or more projects” (PMBOK Guide, 2013, p.10).

Based on Giraudo, Luca and Monaldi, Emmanuele paper presented at PMI Global Congress (2015) that a PMO is fundamentally an organizational structure that centralizes, coordinates, and oversees the management of projects and programs. PMOs can be categorized based on their (a) influence and (b) position within the organization.

(a) Based on the influence and degree of control they have on projects within the organization, PMOs can be categorized as:

- **Supportive:** Supportive PMOs provide a consultative role to projects by supplying templates, best practices, training, access to information and lessons learned from other projects. This type of PMO serves as a project repository. The degree of control provided by the PMO is low.
- **Controlling:** Controlling PMOs provide support and require compliance through various means. Compliance may involve adopting project management frameworks or methodologies, using specific templates, forms, and tools, or conformance to governance. The degree of control provided by the PMO is moderate.
- **Directive:** Directive PMOs take control of projects by directly managing them. The degree of control provided by the PMO is high.

(b) Based on the position they have within the organization, PMOs can be categorized as:

- **Individual PMO** or “Project Management Office”: Individual PMOs typically provide functional support (e.g., infrastructure, document management, training, etc.) to a single complex project or program. They set basic standards and oversee planning and control activities for a single project.
- **Departmental PMO** or “Business Unit PMO”: Departmental PMOs provide support for multiple projects at a department or business unit level. Their primary challenge is to integrate projects of different sizes within a division (e.g., IT, Finance) from small, short term initiatives to multi-year programs with multiple resources and complex integration of technologies.
- **Corporate PMO** or “Enterprise PMO”: Corporate PMOs create standards, processes, and methodologies to improve project performance within an organization. They are typically responsible for allocating resources to different projects across the organization.

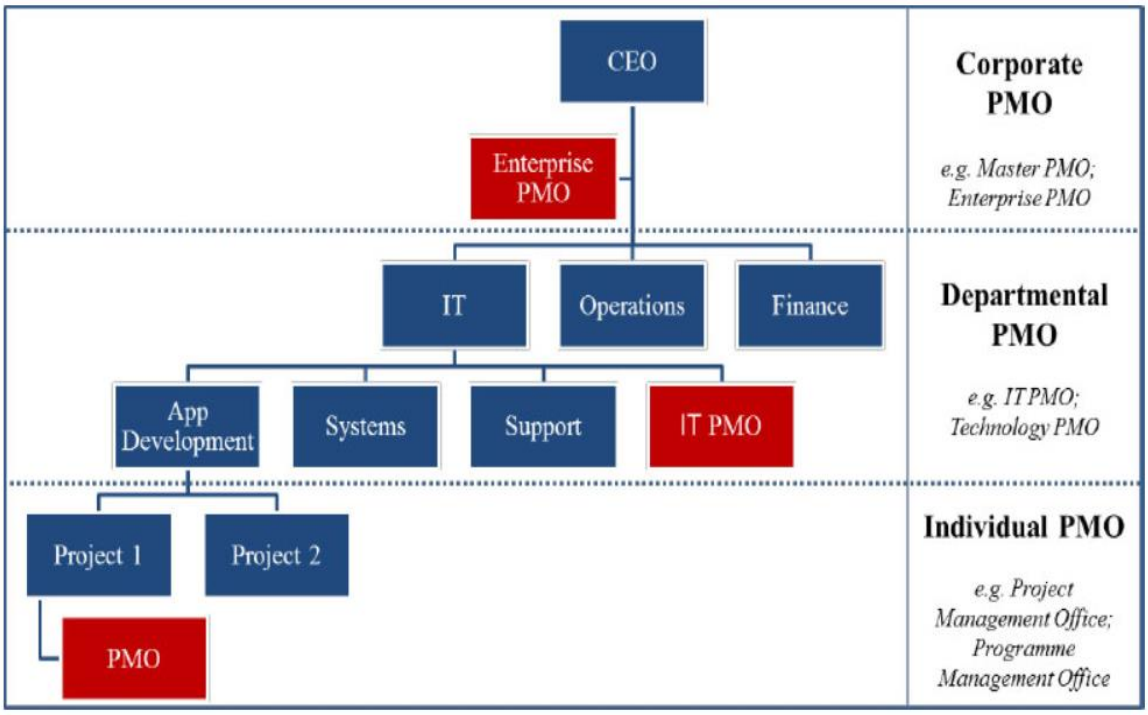

Figure 10 Individual, departmental, and corporate PMOs. (Giraudo & Monaldi, 2015)

For the purpose of this paper, we will define a PMO model as the total structure put in place to deliver projects and services across an organization or enterprise through a single or multiple office. It can be seen as a decision-enabling/delivery support model for all business change within an organization (OGC, 2013).

This may be provided through a single permanent office (e.g., Project Management Office), or through a linked series of offices (Portfolio Offices, Program Offices, and Project Offices); both permanent and temporary, providing a mix of both centralized and localized services.

According to the Portfolio, Programme and Project Offices: P3O (OGC, 2013, pp.39-40), the functional areas of a PMO model can be categorized in three functional areas:

- **Strategic planning** or portfolio support functions/services – these focus on supporting management decisions and may include alignment with strategy, prioritization, benefits realization management, reporting through management dashboards, and so forth.
- **Delivery support** functions/services – these focus on supporting the delivery of change and may be provided through a central flexible resource pool of delivery staff, with capacity planning, and HR management processes.
- **Centre of Excellence** functions of services – these focus on the development of standard methods and processes, developing consistent working practices, and ensuring they are deployed appropriately.

Further, according to Ankit Rastogi, who is a vivid technical writer in the Project Management and Quality Management domains, in the Project Business Management framework, there are various PMO roles which are listed below:

- Enterprise PMO
- Division PMO
- Business Unit PMO
- Project PMO
- Project Office
- Project Support Organization (PSO)
- Project Management Centre of Excellence (PMCoE)

Hence, let’s discuss the responsibilities, accountabilities & authorities of the Business level PMOs:

Enterprise PMO: It is a permanent PMO role for an enterprise. The operational responsibilities include strategic master planning and tactical master planning. They take part in project selection and prioritization. Enterprise PMOs are authorized to review and approve master projects, portfolio, and budget plans. These PMOs report to the CEO or the President.

Division PMO: This too is a permanent PMO role for each division, region or portfolio. Their operational responsibilities include tactical master planning and project portfolio management. They directly report to Division manager or Enterprise PMO. They establish project-portfolio, operational and budget plans, allowing the necessary adjustments when required. They also manage portfolios and oversee programs.

Business Unit PMO: It has a permanent function with one position per business unit. These PMOs are responsible for operations master planning and project-program management. They develop project-program operational plans and budget plans and allow changes if any. They also manage programs and oversee projects, and report to the division manager.

Project PMO: It has a temporary function with one project PMO for each major or critical project. They are responsible for project initiation, planning, execution, monitoring, controlling and closing. Project PMOs take the onus of management of a project and are accountable for a specific major project. They develop project

operational plans and budgets and allow adjustments. They manage, control and report project progress; Project PMOs report to Business Unit PMO.

Project Office: The project office has a temporary function. Their responsibilities include project initiation, planning, execution, monitoring, control, and closing. Sometimes, they also manage projects. The project office is assigned a specific project. It prepares and maintains documentation as per the directions of the project manager.

Project Support Organization (PSO): It is more often than not, a temporary position. They support project initiation, control, planning, execution, monitoring and closing through administrative functions. The PSO is accountable for one or more specific projects. They provide the project control functions. PSO's report project progress and its status to various project managers or a business unit manager.

Project Management Centre of Excellence (PMCoE): The PMCoE generally has a permanent function. It handles establishing, documenting and promoting project business management standards, practices and methods. The PMCoE does this while supporting with tools, templates, training and project management competency. It is not assigned to any project but supports a framework to execute projects effectively.

The PMCoE maintains, updates and advocates for project business management methods, practices, tools, techniques, etc. It establishes project communications such as:

- status reports,
- intranet website,
- dashboards.

The PMCoE reports to management at the enterprise, division or business unit level as applicable. (Greycampus, 2020)

The level of maturity of a PMO results from the extent to which it is capable of generating value for its clients and for the organization as a whole. Considering that a PMO may have multiple approaches and depends on its mission, it would only make sense to analyze its maturity if focus is on what is particular to each of these. The road to PMO maturity begins with establishing the capability to create value for clients and for the whole enterprise; this is followed by implementing and enforcing those practices across all branches of the organisation. PMO maturity models in the scientific literature are limited, and few models have universally accepted standards. Most PMO maturity models are developed from industry by consulting professional firms with experience in the field.

When one considers the expanding role and focus of project management, look at the functions of a PMO, which is involved in managing and coordinating activities for the entire portfolio of projects. While a single project manager is good at focusing on the project at hand, initiating a PMO will aid a corporation in standardizing all projects undertaken its establishment. Hence, some benefits of a PMO are as follows:

- Helping the organization to prioritize projects and getting the right people to execute them consistently using the establishment's standard practices,

- Providing standardization, procedure and templates, orientation, training, support to PM processes in the organizations.
- If properly supported by the high-level management, effectively collect, grouping, making analyses and distributing information to several levels in the organization, in order to support the decision-making process, as well as, providing support to Project Management processes and giving feedback to the project team and medium level management.
- Providing the means for a suitable decision-making process, according to the dynamics of the department, by joining the vision of project management with the vision of organizational management, in terms of corporate governance. This combined vision establishes a link between strategic planning and corporate results, by means of the application of best practices in project management, achieving more success in the projects.
- Providing better corporate results optimizing efforts and resources among projects, sharing risks and contingencies, accelerating schedules, reducing costs, optimizing project cash flows and the overall cash flow, reducing conflicts, managing conflicts, enhancing the communications, documentation, applying best practices, standardization, templates, tools, techniques and software. So, the PMO drives the governance development process.
- Providing methodology, orientation, standardization of processes not only for project management, but also for strategic management of portfolio, programs and projects related processes through data collection and analysis, documentation and reporting, flowcharts and diagrams, templates and forms, spreadsheets and checklists, standard clauses and contracts, procurement and audits, communications and collaborative environments, organizing the decision-making process.
- Establishing mechanisms for project control that allow the integrated planning and control for all projects and for the projects at all, summarizing standard information through effective communications in order to achieve

the strategic goals of the organization, aligned to the corporate strategic planning.

The Agile Manifesto emphasizes collaboration, results, and adaptability over process, documentation, and adherence to plans. In principle, any process whose day-to-day execution reflects these principles is, by definition, an agile process.

An agile PMO is a PMO that uses flexible reporting tools and proactive governance models to support agile projects within an organization.

The impact of an agile mindset goes beyond the definition of specific tactical practices, agile PMOs are more willing to quickly adapt to changes in business needs and project/program requirements than traditional PMOs. Key attributes of an agile PMO are:

- to quickly respond to change in order to retain focus on outcome and benefits in a turbulent economy;
- to balance flexibility and stability; and
- to track and monitor project performances based on agile metrics.

Agile practitioners encourage project teams to continually revalidate their activities and efficiently respond to change, as opposing to executing a pre-set longer term plan. Evolved PMOs need to set the right balance between governance and flexibility. They need to identify the right tools to track, monitor, and report project

performances for the benefit of senior executives required to make informed decisions on the basis of performance metrics.

In order to be successful, evolved PMOs need to obtain and maintain buy-in from senior executives, not accustomed to dealing with governance structures. A shift in mentality is necessary to accept the empowerment of the PMO function, which historically is delegated to a supportive role. (PMO evolution).

The framework represents an important starting point for formalizing PMO roles and responsibilities, understanding how PMOs are leveraged in organizations today, and identifying good practices that practitioners can leverage as the basis for maturing an existing PMO, starting a new PMO, or revitalizing an existing PMO. While it is likely that no PMO will perfectly fit into one of the frameworks described, the general practices described by this document, and supported by quantitative research, provide an excellent starting point for understanding the types of PMOs that generally exist today and how these PMOs create value. By using the information contained here, practitioners can gain additional perspective on the general frameworks of PMOs that exist in practice today, the domains of activities that they undertake, and how these activities contribute to PMO success. This PMO Framework provides strong support of the important role of PMOs in helping organizations achieve business success through effective project, program, and portfolio management practices. Hence, this framework is also excellent guidance to help practitioners understand the types of good practices that are in use in PMOs

today and how adopting these practices can enhance the processes and methodologies within an organization’s PMO.

This framework will be a foundational contribution to understanding the current state of PMO practice as well as for assisting practitioners to develop the next generation of PMOs. The PMO Framework provides a useful one for practitioners to consider in the context of their own PMO as well as a basis for further work to expand our understanding of how to enhance the PMOs business value. (PMI, 2013)

3. METHODOLOGICAL FRAMEWORK

“An information source is a person, thing, or place from which information comes, arises, or is obtained. That source might then inform a person about something or provide knowledge about it. Information sources are divided into separate distinct categories, primary, secondary, tertiary, and so on.”(STANDS4 LLC, 2020)

For the purpose of this FGP, information sources types that will be used are primary and secondary and will be from SLASPA archives, personal experiences, the PMBOK Guide , literature reviews, internet, documentaries and academic journals. Information sources can also be printed or presented in an electronic format.

According to the UNSW Library online “primary sources provide a first-hand account of an event or time period and are considered to be authoritative. They represent original thinking, reports on discoveries or events, or they can share new information. Often these sources are created at the time the events occurred but they can also include sources that are created later. They are usually the first formal appearance of original research.”(2020)

The Following primary information sources that will be used for the purpose of this FGP include, but not limited to:

- diaries, correspondence, logs
- original documents
- interviews, speeches, oral histories
- case law, regulations
- documents, statistical data, research reports
- journal articles reporting new findings
- literature
- newspaper advertisements, reportage and editorial/opinion pieces

For the development of this FGP, the primary information sources that will be used are meeting minutes, personal interviews and questionnaires with employees of SLASPA and some of its key stakeholders, and documented personal experiences.

Primary information sources used for the specific objectives of this research paper are presented in Chart 1.

“Secondary sources involve analysis, synthesis, interpretation, or evaluation of primary sources. They often attempt to describe or explain primary sources Secondary sources offer an analysis, interpretation or a restatement of primary sources and are considered to be persuasive. They often involve generalization, synthesis, interpretation, commentary or evaluation in an attempt to convince the reader of the creator's argument. They often attempt to describe or explain primary sources.” as stated by the UNSW Library.(2020)

Secondary Information sources may include:

- journal articles that comment on or analyze research
- textbooks
- dictionaries and encyclopedias
- books that interpret, analyze
- biographies
- dissertations
- newspaper editorial/opinion pieces
- criticism of literature, art works or music
- blogs

The Following secondary information sources that will be used for the purpose of this FGP include, but not limited to:

- A Guide to Project Management Body of Knowledge
- Related literature studies on project management offices
- MPM course notes.
- PMI database

The secondary information sources used for the specific objectives of this research paper are presented in Chart 1.

Chart 1. Information sources

Objectives	**Information sources**	
	Primary	**Secondary**
To assess the needs of the Engineering Department, to determine its project management strategy; strengths, weaknesses and areas of improvement.	SLASPA's Engineering Department organizational structure, in-house SLASPA policies, procedures and guidelines, operational processes, interview, questionnaires,	PMBOK Guide, PMI database, internet literature and academic journals and research.
To analyze the different PMO types and select the best option for the department.	Interview and questionnaire with the Engineering team including the engineers, supervisors, and some key stakeholders	PMBOK Guide, PMI database, internet literature and academic journals and research.
To determine the strategic purpose of the PMO	Interviews with Engineering team engineers and some key stakeholders.	PMBOK Guide, PMI database, internet literature and academic journals and research.
To develop the scope of the PMO for the Engineering Department	Interviews with Engineering team engineers and some key stakeholders.	PMBOK Guide, PMI database, internet literature and academic journals and research.

(S. Charles, The Author, July 2020)

“Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic.” (University of Newcastle Library, 2020)

For this FGP, the research methods used are primarily analytic-synthetic, deductive–inductive and observation; and are defined as follows:

The analytic method does not permit knowing everything in an absolute way, but only on the basis of a hypothesis. The latter is not necessarily true, given scientific knowledge profits from premises that are true. Therefore, scientific knowledge cannot be based on the analytic method. The replacement of the analytic method with Aristotle’s analytic-synthetic method involves two basic changes.

1) The search for a solution to a problem is a finite process, so the ascending sequence of the premises must terminate. If it did not terminate and there were something above whatever premise taken, then there would be demonstrations of everything.

2) Once the prime premises have been found, the only role which remains for analysis is to find deductions of given conclusions from prime premises. Therefore, the analytic-synthetic method is primarily a method for finding deductions of given conclusions from given prime premises, that is, a method for finding demonstrations in given axiomatic systems.

A synthetic approach to research looks at the research question or topic from a holistic point of view. The researcher tries to understand the parts of the problem by looking at the whole.

An analytic approach to research would look at a topic from a constituent point of view. The researcher tries to understand the whole phenomenon by looking at the separate parts.

A deductive approach is concerned with “developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis” (Wilson, 2010, p.7).

Gulati, PM (2009) stated that “deductive means reasoning from the particular to the general. If a causal relationship or link seems to be implied by a particular theory or case example, it might be true in many cases. A deductive design might test to see if this relationship or link did obtain on more general circumstances” (Research Management: Fundamental and Applied Research, Global India Publications, p.42).

A deductive approach can be explained by the means of hypotheses, which can be derived from the propositions of the theory. In other words, a deductive approach is concerned with deducting conclusions from premises or propositions. Deduction begins with an expected pattern as stated by Babbie, E. R. (2010) “that is tested against observations, whereas induction begins with observations and seeks to find a pattern within them”(“The Practice of Social Research” Cengage Learning, p.52).

Hence, the advantages of a deductive approach, include but are not limited to the following:

- Possibility to explain causal relationships between concepts and variables
- Possibility to measure concepts quantitatively
- Possibility to generalize research findings to a certain extent
- Works from the more general to the more specific.
- Conclusion follows logically from premises (available facts)

Deductive research approach explores a known theory or phenomenon and tests if that theory is valid in given circumstances. It has been noted that “the deductive approach follows the path of logic most closely. The reasoning starts with a theory and leads to a new hypothesis. This hypothesis is put to the test by confronting it

with observations that either lead to a confirmation or a rejection of the hypothesis" (Snider & Larner, 2009, p.16)

Moreover, deductive reasoning can be explained as "reasoning from the general to the particular"(Pelissier, 2008, p.3), whereas inductive reasoning is the opposite. In other words, a deductive approach involves formulation of hypotheses and their subjection to testing during the research process, while inductive studies do not deal with hypotheses in any ways. Application of the deductive approach is shown in Figure 11.

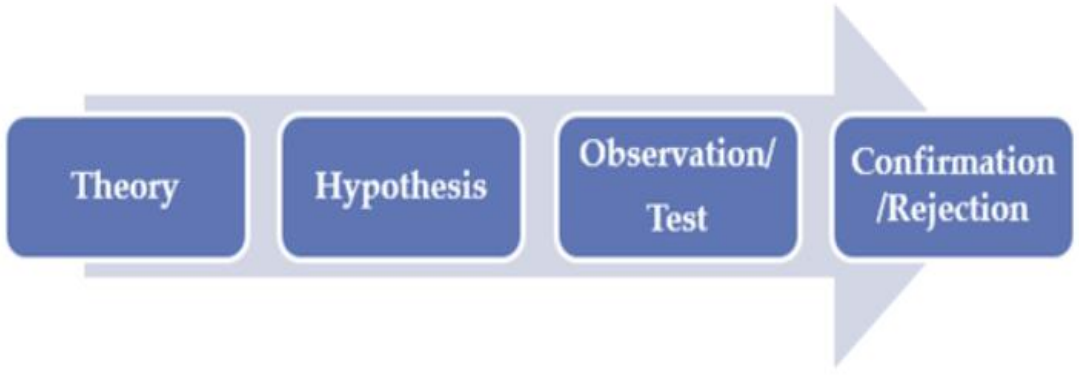

Figure 11 Application of Deductive Approach (Source: Dudovskiy, 2018)

The inductive approach, also known as inductive reasoning, "starts with the observations and theories are proposed towards the end of the research process as a result of observations" (Goddard & Melville, 2004). Inductive research "involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses" (Bernard, 2011, p.7).

No theories or hypotheses would apply in inductive studies at the beginning of the research and the researcher is free in terms of altering the direction for the study after the research process has commenced.

It is important to stress that “inductive approach does not imply disregarding theories when formulating research questions and objectives. This approach aims to generate meanings from the data set collected in order to identify patterns and relationships to build a theory; however, inductive approach does not prevent the researcher from using existing theory to formulate the research question to be explored”.(Saunders et al, 2012).

Inductive reasoning is based on learning from experience. Patterns, resemblances and regularities in experience (premises) are observed in order to reach conclusions (or to generate theory).

“Inductive reasoning begins with detailed observations of the world, which moves towards more abstract generalisations and ideas” (Neuman, 2003).

When following an inductive approach, beginning with a topic, an empirical generalisation must be developed and identify preliminary relationships as the research progresses. No hypotheses can be found at the initial stages of the research and the researcher is not sure about the type and nature of the research findings until the study is completed.

As it is illustrated in Figure 12, “inductive reasoning is often referred to as a “bottom-up” approach to knowing, in which the researcher uses observations to build an abstraction or to describe a picture of the phenomenon that is being studied”(Lodico et al., 2010)

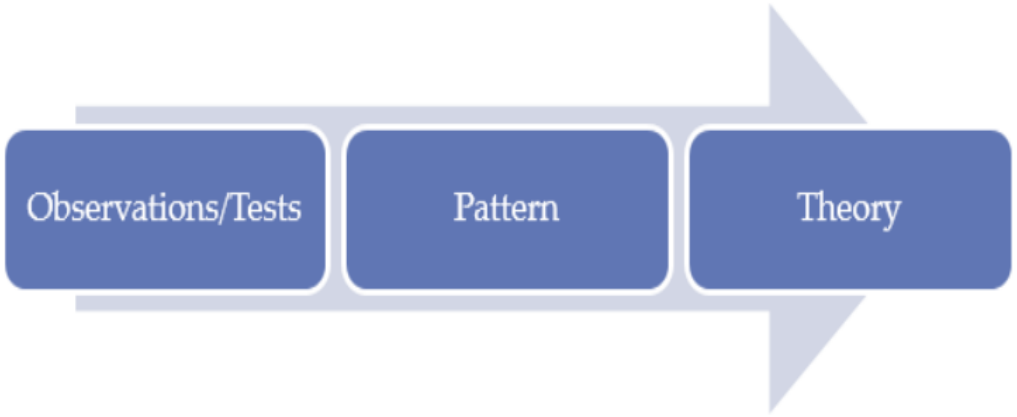

Figure 12 Application of Inductive Approach (Source: Dudovskiy, 2018)

Generally, the application of an inductive approach is associated with qualitative methods of data collection and data analysis, whereas a deductive approach is perceived to be related to quantitative methods. Chart 2 illustrates this classification from a broad perspective as follows:

Chart 2. Classification of Application of Inductive Approach

	Concepts associated with quantitative methods	**Concepts associated with qualitative methods**
Type of reasoning	Deduction Objectivity Causation	Induction Subjectivity Meaning
Type of question	Pre-specified Outcome-oriented	Open-ended Process-oriented
Type of analysis	Numerical estimation Statistical inference	Narrative description Constant comparison

(Dudovskiy, 2018)

However, the statement above is not absolute, and in some instances the inductive approach can be adopted to conduct a quantitative research as well. Chart 3 illustrates patterns of data analysis according to type of research and research approach.

Chart 3. The choice of specific approach depending on circumstances

	Qualitative	***Quantitative***
Inductive	Grounded theory	Exploratory data analysis
Deductive	Qualitative comparative analysis	Structural equation modelling

(Dudovskiy, 2018)

The alternative to the deductive approach is the inductive approach. Chart 4 guides the choice of specific approach depending on circumstances:

Chart 4. The choice of specific approach depending on circumstances

	Deductive approach preferred	Inductive approach preferred
Wealth of literature	Abundance of sources	Scarcity of sources
Time availability	Short time available to complete the study	There is no shortage of time to compete the study
Risk	To avoid risk	Risk is accepted, no theory may emerge at all

(Dudovskiy, 2018)

Observation, as the name implies, is a way of collecting data through observing. The observation data collection method is classified as a participatory study because the researcher has to immerse herself in the setting where her respondents are, while taking notes and/or recording.

Observation as a data collection method can be structured or unstructured. In structured or systematic observation, data collection is conducted using specific variables and according to a pre-defined schedule. Unstructured observation, on the other hand, is conducted in an open and free manner in a sense that there would be no pre-determined variables or objectives.

Advantages of observation data collection methods include direct access to research phenomena, high levels of flexibility in terms of application and generating a permanent record of phenomena to be referred to later. At the

same time, the observation method is disadvantaged with longer time requirements, high levels of observer bias, and the impact of an observer on primary data, in a way that the presence of an observer may influence the behavior of sample group elements.

It is important to note that observation data collection method may be associated with certain ethical issues. Fully informed consent of research participant(s) is one of the basic ethical considerations to be adhered to by researchers. At the same time, the behavior of sample group members may change with negative implications on the level of research validity if they are notified about the presence of the observer. (Dudovskiy, 2018)

The summary of research methods is shown in Chart 5.

Chart 5. Research methods

Objectives	**Research methods**		
	Analytic-Synthetic Method	Deductive - Inductive Method	Observational Method
To assess the needs of the Engineering Department, to determine its project management strategy; strengths, weaknesses and areas of improvement.	To assess the current maturity status of the Engineering Department	To assess the current maturity status of Engineering Department	

Chart 6. Research methods, Continued

To analyze the different PMO types and select the best option for the department.	To study and understand the general roles and responsibilities of a PMO in an organization.	To study and understand the general roles and responsibilities of a PMO in an organization.	
To determine the strategic purpose of the proposed PMO	The critical thinking of the strategic purpose to be assigned to the PMO for the first time in the history of SLASPA.	This is the critical thinking of the strategic purpose to be assigned to the PMO for the first time in the history of SLASPA.	
To develop the scope of the PMO for the Engineering Department	The critical thinking and analytical guide to developing the scope for the proposed PMO.	The critical thinking and analytical guide to developing the scope for the proposed PMO.	The critical thinking and analytical guide to developing the scope for the proposed PMO.

(S. Charles, The Author, July 2020)

A research tool may be defined as: “Anything that becomes a means of collecting information for your study is called a research tool or a research instrument. For example, observation forms, interview schedules, questionnaires, and interview guides are all classified as research tools.” (Civil Engineering Terms, 2015)

Research tools are the first practical steps in carrying out research process. The researcher will need to decide how one will collect the data then construct a research instrument for this.

For the purpose of this research paper, the summary of tools is shown in Chart 8.

Chart 7. Tools

Objectives	Tools
To assess the needs of the Engineering Department, to determine its project management strategy; strengths, weaknesses and areas of improvement.	Maturity assessment model
To analyze the different PMO types and select the best option for the department.	Meetings, Expert judgment, Stakeholders consultation,
To determine the strategic purpose of the PMO	Meetings, Expert judgment, Stakeholders consultation,
To develop the scope of the PMO for the Engineering Department	Stakeholders consultation, experts’ advice.

(S. Charles, The Author, July 2020)

An assumption is defined, according to PMBOK Guide: “An actor in the planning process that is considered to be true, real, or certain, without proof or demonstration” and a constraint is “A limiting factor that affects the execution of a project or process”. (PMBOK Guide, 2013, p.124)

The assumptions of this final graduation project are:

- SLASPA's Engineering Department current operations needs a PMO.
- A PMO will be more effective with project implementation in the hierarchy of the Engineering Department organizational structure.
- A non-complex PMO would be more appropriate for the Engineering Department at SLASPA.
- Developing a methodology to plan SLASPA's Engineering Department projects schedule would lead to higher project implementation and better return on investment (ROI).

The Constraints of this project are as follows:

- The time requirement for this project is very short, about four (4) months, consequently making it the main constraints of this project. A lot more supporting areas for this research could have been developed if time allowed it.
- To develop a project management office proposal for SLASPA's Engineering Department, which requires determining the maturity level of the department and the project scope for this research paper. The actual project scope entails the implementation of a PMO plan and defining the required sequence of its implementation in sufficient facts.
- Finding the right Maturity assessment Model for this FGP is difficult.
- Management sensitivity or lack thereof for the value of PMO is part of SLASPA's Engineering Department organizational structure.

For the purpose of this research paper, a summary of assumptions and constraints is shown in Chart 7.

Chart 8. Assumptions and constraints

Objectives	Assumptions	Constraints

To assess the needs of the Engineering Department, to determine its project management strategy; strengths, weaknesses and areas of improvement.	SLASPA's Engineering Department needs a PMO	Finding the right Maturity assessment model for the FGP
To analyze the different PMO types and select the best option for the department.	A PMO to be within the hierarchy of Engineering Department organizational structure will be more effective with Project implementation.	Management sensitivity or lack for the value of PMO within the Engineering Department's Organizational structure.
To determine the strategic purpose of the PMO	A non-complex PMO would be better	Scope and time.
To develop the scope of the PMO for the Engineering Department	Develop a scope for the proposed PMO for SLASPA's Engineering Department that would lead to higher project implementation and better return on investment (ROI).	Scope and time.

(S. Charles, The Author, July 2020)

“A deliverable is a tangible or intangible good or service produced as a result of a project that is intended to be delivered to a customer (either internal or external). A deliverable could be a report, a document, a software product, a server upgrade or any other building block of an overall project.” (Kermit Burley, 2013). A deliverable may be composed of multiple smaller deliverables. It may be either an outcome to be achieved or an output to be provided.

“Some deliverables are dependent on other deliverables being completed first; this is common in projects with multiple successive milestones” (What is a Deliverable in Project Management? Wrike. Accessed 8 August 2017). In this way many time-savings are possible, shortening greatly the whole project final.

“A deliverable differs from a project milestone in that a milestone is a measurement of progress toward an output, whereas the deliverable is the output delivered to a customer or sponsor (Roseke, 2016).

The deliverables of this FGP are as follows, but not limited to:

- Report of the level of maturity of SLASPA’s Engineering Department.
- Report detailing the different PMO types and select the best option for SLASPA’s Engineering Department.
- Report detailing the the strategic purpose of the.PMO.
- Report of the appropriate scope of the PMO.

A summary of the deliverables of the FGP are shown in Chart 8.

Chart 9. Deliverables

Objectives	Deliverables
To assess the needs of the Engineering Department, to determine its project management strategy; strengths, weaknesses and areas of improvement.	Report of the level of maturity of SLASPA's Engineering Department.
To analyze the different PMO types and select the best option for the department.	Report detailing the most suitable type of PMO to be assigned for SLASPA's Engineering Department.
To determine the strategic purpose of the proposed PMO.	Details on the suitable vision, mission statements for SLASPA's Engineering Department PMO.
To develop the scope of the proposed PMO for the Engineering Department	Report of the appropriate PMO scope and validating its scope.

(S .Charles, The Author, July 2020)

4. RESULTS

A Lean Six Sigma maturity assessment, which is a self-evaluation of where the organization stands was used for Objective 1. The key to successful implementation of Lean Six Sigma lies in knowing where the organization needs to be in the future, likewise, it is equally important to know its current state. A Lean Six Sigma maturity assessment highlights how advanced the organization is in terms of Lean Six Sigma perspective, its strengths, weaknesses and improvement opportunities. The assessment enables detailed, step-by-step, quantitative scoring to diagnose the current state.

A scorecard was done utilizing the Six Sigma methodology guidelines to identify the extent of assessment for the Engineering Department's maturity level. This scorecard comprised of the twelve (12) Lean Six Sigma parameters with each question being rated on a scale of one (1) to five (5) with one (1) being the least favorable and five (5) being the optimum option to attain the highest maturity level.

Twenty-four employees including Engineering staff and Senior Management were randomly selected as respondents to this scorecard. Also, for the purpose of this research, four(4) meetings and consultations were held with SLASPA Employees to obtain their feedback, with an average of about twenty (20) employees per session.

Hence, the following maturity assessment results were obtained based on the scorecard responses obtained and along with review and analysis of those responses. The three-phase (3A) approach which is that of 1) assess, 2) analyze and 3) address was used for the Lean Six Sigma maturity assessment.

The assess phase involves the use of a scorecard of Lean Six Sigma parameters. The scorecard was completed by both Engineering staff and Senior Management

randomly within SLASPA. The scorecard in the Chart 9 addresses the 12 Lean Six Sigma parameters:

1. Leadership alignment
2. Leadership approach toward Lean Six Sigma
3. Employee involvement
4. Training
5. Process capability
6. Approach to errors
7. Data-driven problem solving
8. Continuous improvement methodologies
9. Standard work
10. Value stream mapping
11. Accounting support to Lean Six Sigma
12. 5S/housekeeping

A 1-to-5 rating scale is used to assess the selected Lean Six Sigma parameters, where 1 represents the lowest level of maturity and 5 is best in class. Chart 9 highlights the results of the Lean Six Sigma Maturity Assessment Scorecard along with details for scoring criteria.

Chart 10. Lean Six Sigma Maturity Assessment Scorecard Results

Parameters	1	2	3	4	5	Average Score (1-5)
Leadership alignment	No leadership alignment for process improvements	Leadership is somewhat aligned with process improvements, but visible and active selection and review of projects are not in place. No trained and committed resources available to support projects	Leadership aligned with process improvements, visible and active selection and review of projects. No resources available to support projects	Leadership is aligned with vital few metrics, visible selection and review of projects. Some trained resources available	Trained and committed resources supporting projects	**3**
Leadership approach toward Lean	Company executives demonstrate no understanding of the Lean approach	Executives demonstrate an understanding of the Lean approach	Executives demonstrate an understanding or Lean but do not have full faith	Executives demonstrate good understanding and have faith in Lean. Leadership committed but not prepared for accelerated biz improvement	Sr. execs have full understanding and faith in Lean; leadership prepared for accelerated biz improvement	**1.5**

Chart 11. Lean Maturity Assessment Scorecard Results, Continued

Employee involvement	Little or no involvement of people in process improvements	Involvement of people in process improvements to some extent and people are eager to work in teams	People form cross-functional teams whenever a problem arises	Quality improvement, problem solving and corrective action teams in place. 25 to 50% of employees involved in teams	50% or more involved in teams; open access to top management; empowered to stop the process for quality	2
Training/ Education	No training on Lean tools or quality improvement tools, methodologies or even concepts	Few team members have heard about different concepts of improvement methodology but not formally trained	Team members are trained in some basic concepts like 5S, Lean overview, 7 QC tools	Team members have good understanding of process improvement methodologies	More than 5% of employee time devoted to training and implementing improvements	**2**

Chart 12. Lean Maturity Assessment Scorecard Results, Continued

Process capability	Assessment has sigma level less than or equal to 1, for its critical process. Cpk is less than or equal to 0.33	The area has sigma level greater than 1 but less than or equal to 2. Cpk lies between 0.33 and 0.66	The area has sigma level greater than 2 but less than or equal to 4. Cpk lies between 0.66 and 1.33	The area has sigma level greater than 4 but less than 6. Cpk lies between 1.33 and 2	Has sigma level greater than or equal to 6. Cpk is greater than or equal to 2	1
Approach to errors	Errors will happen; inspect them out; accept cost of scrap and rework; deal with customer complaints	Although errors happen but some initial thought prevails to implement or design error-free systems using Lean	Inspection and control only; some data collection to regulate variance	Inspection, control and improve; data collected to regulate variance	Zero-defect quality mindset	**1.5**
Data driven problem solving	Insufficient data available for key processes needing improvement	Organization does not use data driven problem solving methods to a great extent. Data collection processes are not systematic and in place	Org uses data driven problem solving methods. Data collection is systematic and efficient, although MSA not done extensively	MSA is done extensively and people know the tools needed to analyse data	Org uses data driven problem solving methods across the spectrum	**1**

Chart 13. Lean Maturity Assessment Scorecard Results, Continued

Methodologies of continuous improvement (CI)	No formalized improvement methods exist. No evidence of employees, or managers concerned about CI	Improvements reactive – usually come from management, engineering, supervision or when a customer complaint is received. Some training started in problem solving	Some improvement methodology evident; teams sometimes used to develop solutions. CI training supported by management	CI used to advance company. All associates trained. Open documentation and dashboards used to track improvements tied to dollar savings	Methods such as PDCA are known and used by all employees; CI is part of company culture	2
Standard work	No standard work procedures exist. No understanding of the connection between CI and work standards	Some standard work procedures exist to show how the process made, administrative processes function but are not current nor displayed. Thinking of internal customers begins	All standard work procedures can be seen in most areas. Process owners know the what, when, where, why and how of their areas. Ownership taken to use standards and keep them current	Standard work procedures are current and posted in appropriate areas	Employees have quick and free access to all standard work. CI to operations reflected in procedures	**2**

Chart 14. Lean Maturity Assessment Scorecard Results, Continued

Value stream mapping	No process is mapped according to the value stream	An understanding of VSM is evident. Some attempts have been made to map a simple process	A number of people have been trained in VSM, some processes mapped. No improvements	Most understand value of VSM. Mapping has uncovered opportunities for improvement. Action plans are in place. Rapid improvement blitzes preceded by VSM	Most processes mapped with results of action plans recorded	1
Accounting support to Lean	Accounting system provides basic financial data based on cost accounting. There is little awareness of accounting's role in support Lean initiatives	There is an awareness that accounting has a role in Lean. Some staff has been trained and initial analysis has been undertaken	All key staff has been trained. Pilot project has begun; department targeting waste in its processes	Key value streams are using Lean. Decisions are being made using Lean financial data. Some initial investigation to review current standard cost methods	Accounting system provides financial data based on measurements at the value stream level and provide support for Lean	**1**

Chart 15. Lean Maturity Assessment Scorecard Results, Continued

5S/House-keeping	Disruptive and messy, no formal workplace organization standard in place. No order, area untidy, materials have multiple locations	Company aware of 5S principles but no training underway. Non-routine cleaning takes place	Most areas have begun 5S. Materials have permanent positions, cleaning schedule followed. Teams investigate root causes of disorder. Employees participate, support, understand and do most cleaning	Audit teams assess 5S standards. All areas working on standardizing processes. Evidence of employee pride	Clean, orderly, self-maintained; always "tour ready"	2
					Total Maturity Index	**1.67**

(Source by Are You Ready? How to Conduct a Maturity Assessment, 2012)

In the category of “Leadership alignment”, the results of the maturity assessment indicated that leadership is aligned with process improvements, visible and active selection and review of projects. Hence, no resources are available to support PMO.

In the category of “Leadership towards Lean six sigma”, it was recorded that the company executive demonstrated an understanding of the Lean six sigma approach to project management.

The results from the “Employee involvement category “showed that there was an Involvement of people in process improvements to some extent and people are eager to work in teams.

The results from the category of “Training and Education” indicated that just a Few team members have heard about different concepts of improvement methodology but not formally trained

In the category of “approach to errors”, the results of the assessment showed that although errors happen but some initial thought prevails to implement or design error-free systems, however we accept cost of scrap and rework; deal with customer complaints

The results from the analysis of the category of “methodology of continuous improvement” indicate an Improvements reactive department which usually come from management, engineering, supervision or when a customer complaint is received. Some training started in problem solving.

In the category of “Standard work” the results show there are some standard work procedures that exist to show how the process made, materials flow and administrative processes function but are not current nor displayed. Thinking of internal customers begins.

In the area of “value stream mapping”, the survey shows that most respondents believe that the Engineering Department does not use value stream mapping to plan its projects and there are no processes for mapped according to the value stream. It was recommended that it should be used for future projects improvements.

In the category of “Accounting”, the results from the assessment show that the current accounting system used by the Engineering Department, only records the basic financial data based on cost accounting. There is little awareness of the impact of the role of accounting in support of the six sigma approach or initiative.

And lastly, the results from the “5S/House-keeping” indicate that the Company is aware of 5S principles but no training underway. Non-routine cleaning takes place.

At the end of the assessment, the results demonstrated the strengths, weaknesses and improvement opportunities of the Engineering Department, and by extension SLASPA. Moreover, it further deepened the “why” the Engineering Department, and by extension SLASPA needs a PMO.

Upon the Lean Six Sigma deployment and the completed scorecards linked to the various verticals in the organization, the analysis phase commenced. The goal of the analyze phase is to identify the most important parameters on which to start working.

To do this, Figure 13 was created comparing the scores for the individual parameters to the organization’s Lean Six Sigma maturity index (the average of all those scores). The bars on the left side of the graph represent the weaknesses of the organization. Because these parameters achieved lower scores they are a matter of concern and need immediate attention. The parameters on the right-hand side are those with the highest scores, making them strengths. The difference between the Lean Six Sigma maturity index and the desired score of 5 is known as the maturity gap.

Once the key parameters for improvement are agreed upon, based on this gap analysis, the second phase was completed.

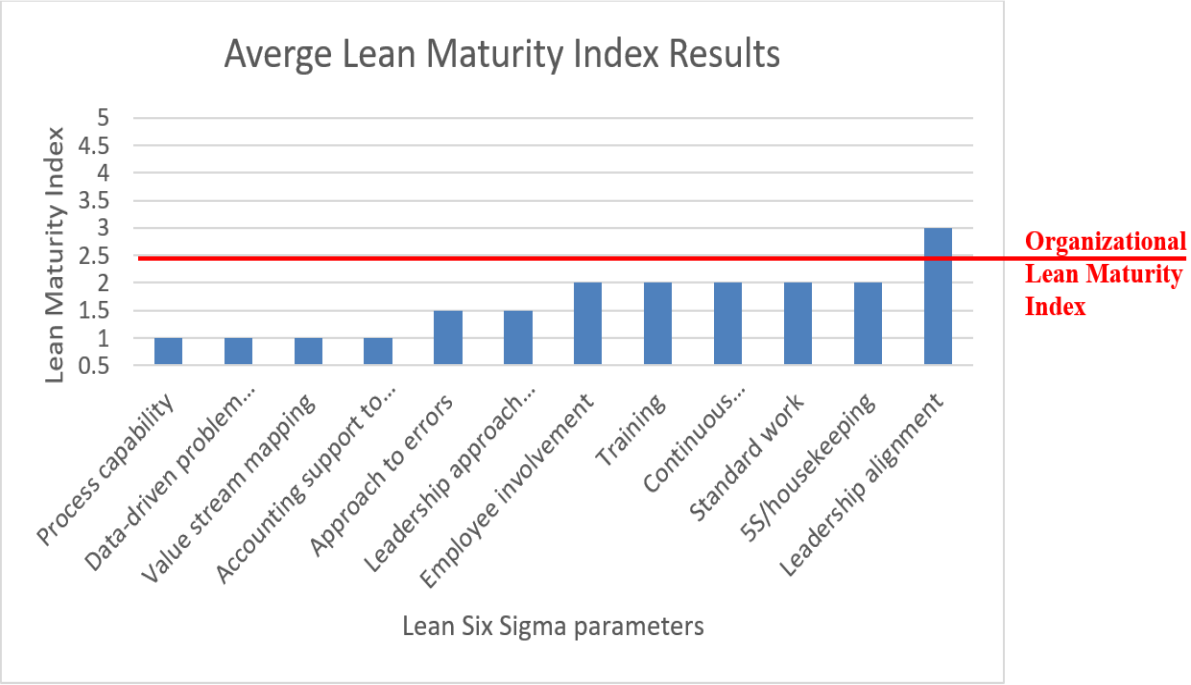

Figure 13. Lean Six Sigma Parameters Compared to the Organizational Maturity Index (Gap Analysis)

In this last phase, the maturity gap analysis is completed, and the key parameters for improvement are determined based on the gap analysis. This phase consists of gathering the key stakeholders in the organization to begin addressing the weaknesses and start the process of addressing them. To begin the process of addressing, the second FGP objective, which is to analyze the different PMO types and select the best option for the department, is addressed.

For a PMO to be effective, it needs the correct level of support especially from the PMO sponsor. However, it is also important to have support from other critical stakeholders; without their support it can make implementing the tools and processes for a PMO very difficult. In the stakeholder analysis the key stakeholders were identified and also having an understanding if they are supportive (or not) of the PMO. This was achieved by conducting a stakeholder analysis.

For research purposes the stakeholder analysis is defined as a process of identifying all of the stakeholders who have an interest and or influence over the PMO so as to understand who will be supportive and who will not be supportive (PMO stakeholder analysis, 2018). Further, this also allows a plan to be created for those who are not supportive to be moved to being supportive.

Stakeholders were captured by simply identifying all of the stakeholders who have an interest and / or influence over the PMO. Hence, the names of the stakeholders are captioned in Chart 14 and Figure 13 together with their respective role as it related specifically to the PMO.

For each stakeholder, their power and influence over the PMO was evaluated as follows:

1. Low power, low influence
2. Low power, high influence
3. High power, low influence
4. High power, high influence

Those identified as 1. low power, low influence can exercise the least impact on the PMO. Those identified as 4, high power, high influence can exercise the most impact and can be a great help (or hindrance) to the PMO. That said, caution is required for those in 2, low power, high influence. They may have the ability to influence those with high power(PMO stakeholder analysis, 2018)

Each stakeholder was then assessed as follows, namely:

- Advocate – supportive
- Blocker – not supportive
- Neutral

Then lastly, for each stakeholder their level of support required was indicated.

As can be seen from the information on the stakeholder analysis highlighted in Chart 10, one can easily see that there are a few stakeholders who are neutral and most are advocates for the PMO.

Chart 16. Stakeholder Analysis

				Advocate / Blocker	
Ref	**Name**	**Role**	**Influence**	**Current**	**Required**
1	SLASPA's Board of Directors	Board of Directors	4. High power - high influence	Advocate	Advocate
2	Daren Cenac	General Manager	4. High power - high influence	Advocate	Advocate
3	Grace Parkinson	Chief Operating Officer	3. High power - low influence	Advocate	Advocate
4	Keith Thompson	Financial Controller	4. High power - high influence	Neutral	Advocate
5	Adrian Hilaire	Director of Seaports	4. High power - high influence	Advocate	Advocate
6	Lambert Remy	Director of Airports	4. High power - high influence	Advocate	Advocate
7	Alva Francis	Chief Engineer	4. High power - high influence	Advocate	Advocate
8	Gasper George	Senior Manager, Business Development and Corporate Communications	4. High power - high influence	Advocate	Advocate
9	Kaisher Von Whal	Director, Internal Audit	3. High power - low influence	Neutral	Neutral
10	Beverly Dulcie	Manger, Administration	2. Low power - high influence	Advocate	Advocate
11	Kennedy Francis	Chief of Ports Police	2. Low power - high influence	Neutral	Advocate
12	Christopher Alexander	Director of Maritime	1. Low power - low influence	Neutral	Advocate
13	Joanna Biscette	Senior Manager HR	3. High power - low influence	Neutral	Advocate
14	Marcellina Preville	Duty Financial Controller	1. Low power - low influence	Neutral	Neutral
15	Saydia Charles	Civil Engineer	2. Low power - high influence	Advocate	Advocate
16	Mandel Samuel	Mechanical Engineer	2. Low power - high influence	Advocate	Advocate
17	Engineering Supervisors	Engineering Supervisors	1. Low power - low influence	Advocate	Advocate

(S. Charles, The Author, December 2020)

Figure 14 also captures the stakeholders onto a stakeholder map (similar to a SWOT analysis) using color labels.

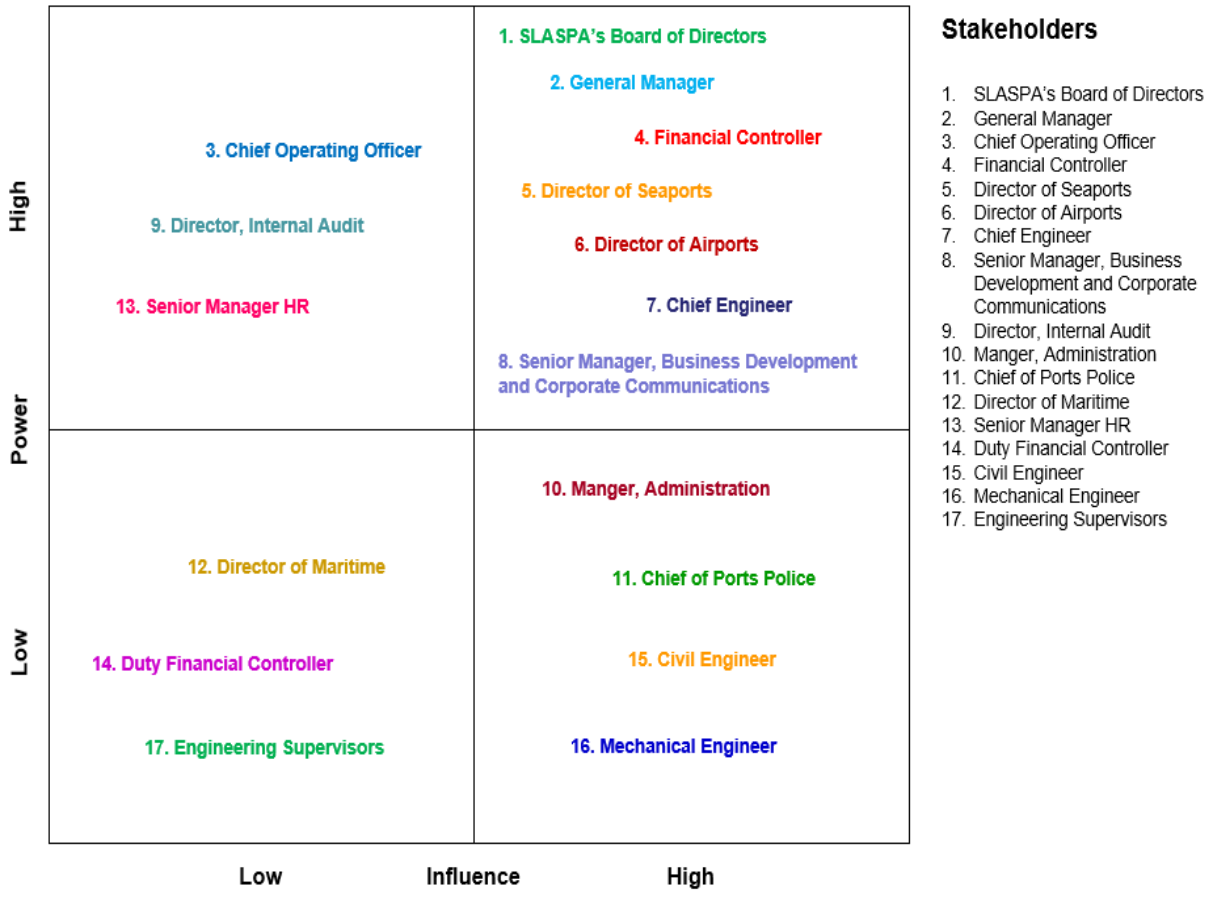

Figure 14. Stakeholder Analysis Map (S. Charles, The Author, December 2020)

After identifying and evaluating the stakeholders, their need to be managed. Attention is particularly required in moving those that are marked as Blockers to Neutral or Advocate. Focus will be on those with high power, high influence. However, those who are Advocate's will not be disregarded, as they are needed to keep them engaged.

In order for a PMO to be selected as per the second FGP objective, an analysis of the different types of PMO and the selection of the best option for the department is addressed. The criteria used to choose a PMO for the Engineering Department was based on two (2) main defining aspects of a PMO. The two (2) main defining criteria aspects are, firstly the range of PMO authority or control the PMO possesses, and secondly the responsibility as a governance and standardization resource body. Chart 11 summarizes these findings.

This phase consists of gathering key stakeholders to discuss the weaknesses of the company and begin the process of addressing them. The better recommended technique utilized in this phase was to collect ideas for making improvements to these weaknesses is the use of brainstorming technique. With this technique of brainstorming, each stakeholder wrote down their ideas to address the weaknesses identified rather than immediately share them aloud. This technique is different from the traditional brain storming technique in that, the ideas are written individually and then later sorted for their commonality and hierarchy as opposed to sharing each idea openly. Thereafter actions deemed attainable are then pursued as planned.

It is difficult to analyze a PMO without a typology (the three types of PMO). There are three (3) basic PMO types as previously cited, namely supporting, controlling and directive. Each PMO type is subsequently analyzed.

In the analysis of the three PMO types it was apprehended that, each type of PMO has its function and impact based on the type of organization, its structure, its culture and most importantly, what its objectives are for the overall success of that organization. It is only when an organization is carefully identified, and its departments researched and understood that, one can propose a suitable PMO for that organization. In parallel, project management structures continue to evolve.

After exposing the details of each PMO to the key stakeholders, an activity was generated. The responsibilities and levels of control of each PMO were distributed amongst ten (10) key stakeholders. These ten (10) stakeholders comprised of five (5) senior management and five (5) seniors of the Engineering Department team (Engineers and supervisors). Each person was asked to put in a box, which responsibilities and level of authority they desired for the PMO. The result of this exercise indicated that most stakeholders preferred to have a PMO with supporting characteristics, along with the benefits of project and processes governance. In other words, a hybrid of PMOs.

Chart 17. Types of PMOs, its Responsibility & level of control Scorecard Results

PMO TYPES	RESPONSIBILITY	LEVEL OF CONTROL	TOTAL STAKEHOLDERS REPONSE
Supporting	Provide templates Provide Best practices Provide Training Share resources	Low level of control	5
Controlling	Provide governance and conformance	Moderate level of Control	5
Directive	Directly manage projects Provide strong governance frameworks	Top level control	0

(S. Charles, The Author, December 2020)

As it pertains to this research, SLASPA's structure and culture unquestionably requires a PMO. This is vastly based on the results from the stakeholders highlighted in this results chapter. The general consensus among the stakeholders was that the Engineering Department should have the full characteristics of a traditional supporting PMO with a strong compliance governance characteristic of a controlling PMO. Hence, based on the results and the analysis of different PMO types based on the current Engineering status and SLASPA's culture, a **hybrid** of two PMOs (supporting & controlling PMOs) was selected. Further, the results of the maturity assessment and the current operational culture of the Engineering Department, coupled with the functions of the two types of PMOs (Controlling and Supporting), it was realized that a merger of both are best suited.

A Directive structure PMO would not be suitable based on the consultation exercise with the key stakeholders, it was understood that SLASPA, and more specifically the Engineering Department, did not want to surrender absolute control of its current modus operandi. The overall consensus articulated was that the organization has a preference to be supported by the provision of expertise from within the Engineering Department. The weaknesses identified from the maturity assessment, via the use of scorecards, further highlights the argument for choosing a PMO. The importance of directly linking the results of the assessments conducted must be noted when choosing a type of PMO.

The analysis of the different types of PMO also revealed that the Engineering Department at this point of its maturity could not embark on a Directive PMO and this is primarily due to its maturity level currently being very low. It was assumed that a Directive PMO might be required when the Engineering Department's obtains a maturity level of 4 or 5 (with 5 being the highest maturity level). Currently, the Engineering department utilizes basic project management processes according to findings of this research.

With reference to a supportive PMO which would provide a consultative role to the organization as and when required to projects, it is also not suitable based on the consultation exercise with the key stakeholders. This type of PMO serves as a project repository and provides a low level of control, and since it cannot enforce anything on any project, instead it supplies templates, best practices, training, access to information and lessons learned from other projects. This type of PMO could have been adopted if the organization had a functional matrix type, which currently does not exist. With a functional matrix organization, project managers have very little control. Functional managers manage virtually all activities, and the budget is under their sole control. Project managers are generally in project expedition or project coordinator roles. They collect, document and store the project activities in the organization's assets library.

The analysis of the different types of PMO further highlighted that the Engineering Department at this point of its maturity could not fully embark on a Controlling PMO and this is also primarily due to its maturity level currently being very low. It was assumed that a Controlling PMO might be required when the Engineering Department's obtains a maturity level of above the average of 2.5 but lower than 4. A controlling PMO does everything that a supportive PMO does and more. The most important aspect of this type of PMO is that it has the power to enforce compliance with organizational practices. A Supportive PMO can only guide and recommend but does not have the power to enforce compliance across projects. A Controlling PMO exercises a moderate level of control over the projects and is best suited for organizations with balanced matrix type of organizational structure. Further a controlling PMO provides support, guidance in managing projects by training in Project Management and PM Software; and assisting with specific tools when required. Further, the controlling PMO **e**nforces compliance to organizational practices through various means such as project management frameworks or methodologies, use of specific tools and templates and conformance to good governance frameworks.

Based on Giraudo, and Monaldi paper presented at PMI Global Congress (2015) that a PMO is fundamentally an organizational structure that centralizes, coordinates, and oversees the management of projects and programs. The PMO was categorized based on its position within the organization as a Departmental PMO or “Business Unit PMO” This departmental PMO will provide support for multiple projects at a department unit level. Its primary challenge will be to integrate projects of different sizes within a division (in this case Engineering) from small, short term initiatives to multi-year programs with multiple resources and complex integration of technologies.

The individual PMO is not suitable as they typically provide functional support (such as infrastructure, document management, training, etc.) to a single complex project and this is not the case for SLASPA, primarily due to multiple projects being done at the same time. Individual PMO set basic standards and oversee planning and control activities for a single project.

The results of the interviews conducted for this research highlighted that there is resistance from senior management, with the exception of Engineering, to directly be responsible for the PMO. Thus, it is necessary that independent personnel be set up to administer and evaluate the capital projects management mandated by the organization. It was also the consensus of most of the stakeholders that a major setback for the organization is that there is a lack of personnel for direct project management and that the Engineering Department should sustain the responsibility to control an independent body to manage it.

The PMO will be located within the Engineering Department. Figure 15 highlights the proposed Engineering Department organizational structure, which includes the PMO. The Engineering Department on an average manages and implements 80% of SLASPA’s projects (both capital and recurrent) on an annual basis. The

Engineering Department also supports other departments with the implementation of their projects.

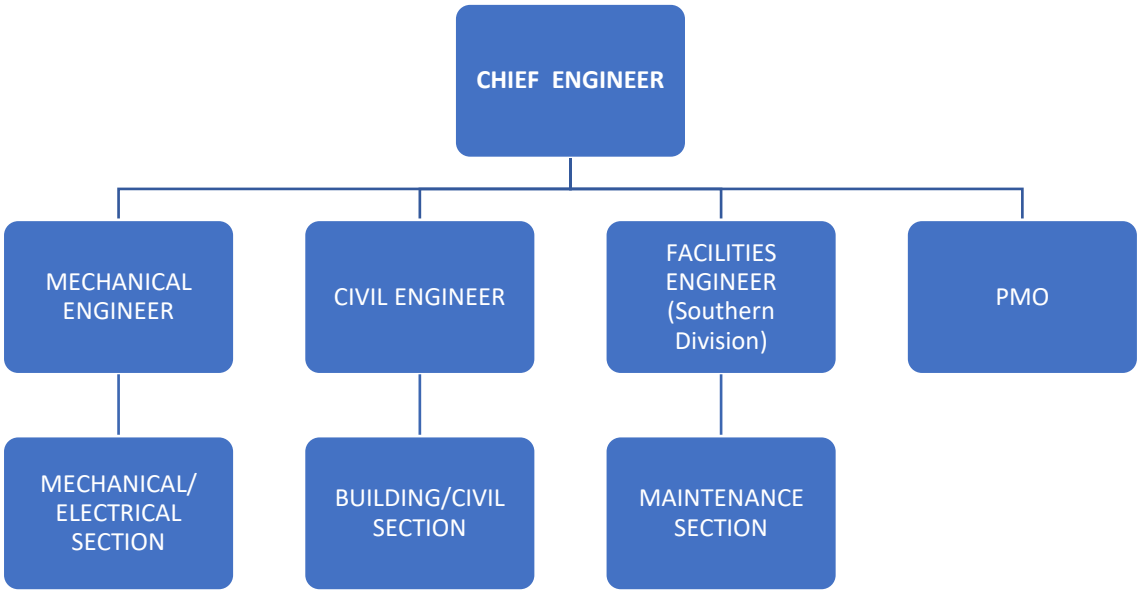

Figure 15. Proposed Engineering Department Organizational structure

In discussions with stakeholders through independent research, it was identified that establishing a vision for the PMO early is a critical factor for success. The vision, mission of the PMO was developed with SLASPA's organizational goals in mind. When selecting projects, it is also important that the vision of the individual projects undertaken align with the goals and values of SLASPA. An effective mission statement clearly identifies why the PMO exists. It describes the function of the PMO, how the PMO will conduct its business, and who the PMO clients will be.

The mission of the Engineering Department Project Management Office (PMO) is to provide an enterprise-wide approach to identify, prioritize, and successfully execute an Engineering portfolio of initiatives and projects that are aligned with SLASPA's organizational strategic goals and vision.

The PMOs primary responsibility is to manage and control project constraints by ensuring project plans are implemented on schedule, within scope, and budget. Project management leadership is responsible for establishing and implementing

best practices for the benefit of SLASPA in a way that encourages collaboration, standardization, and overall improvement in our organization.

- Support departments, staff, and SLASPA's port communities as a source for project management leadership and expertise.
- Promote best practice standards, quality, and methodologies in a project management discipline.
- Utilize PMBOK Guide based methodology as well as support "best fit" approach for project management in Engineering.
- Provide a channel of communication for project status, financial health, mitigation of issues, risk, and dependencies across projects and departments.
- Build project management maturity at the organizational level.

According to the PMO type, its objectives are as follows:

- Use the proper methodologies and best practices standards to ensure successful completion of the project.
- Manage the Engineering Department projects portfolio.
- Keep SLASPA's executive management and the relevant Heads of Department informed on all project's status.
- Serve as the Engineering Department's authority on Engineering Project Management practices.
- Build Project Management maturity at the departmental level.

It is recommended that the PMO be staffed by one full-time Project Manager and that this organization coordinate the work of the Engineering Departmental projects and also the staff who manage these projects as part of their regular duties.

Existing research and studies have put enormous efforts into defining and clarifying the concept of PMO. The fact that researchers have not been able to develop a unified and commonly accepted definition for a PMO reflects the complexity of the

phenomenon that is studied. The Project Management Institute (PMI) defined a PMO as “An organizational body or entity assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. The responsibilities of the PMO can range from providing project management support functions to actually being responsible for the direct management of a project” (PMI, 2004). Pellegrinelli and Garagna (2009) said that “PMOs are organizations’ responses to their needs and environments—unique structural arrangements designed to fulfil a specific purpose.” In a similar vein, several attempts have been made to identify the functions and to classify PMOs based on the services, structural characteristics, or organizational level in which they are embedded. For example, Hobbs (2007) identified through empirical research 27 functions for PMOs ranging from report statuses to upper management to recruitment, selection, and salary definition for project managers.

In this research, the project management office is defined as a departmental entity that supports the management of a project-based organization, and/or management of internal development projects. Prevalent literature makes distinctions between single project PMOs and multiple project PMOs (Pellegrinelli & Garagna, 2009). Single project PMOs are established to support the manager of single project entity, whereas multiple project PMOs are dedicated to support project management practices in several projects. In this study, we focus on the latter type of PMOs, those that are set up to serve several projects in the organization.

In order to provide understanding on this PMO research, PMO studies have been reviewed on project management offices and the main contributions of each study. Chart 13 shows that the understanding of PMOs is still in its early phases, even if PMOs have been a reality in many companies for several decades (Kerzner, 2003). The results of the reviewed studies reveal three interesting qualities related to PMOs. First, characteristics of PMOs seem to differ according to organizational context (Hobbs & Aubry, 2008). Second, the PMO is an interception or network of relations that connects an organization's strategy, structures, and projects (Aubry et al.,

2007). Third, the form and functions of a PMO co-evolves with the larger organizational system in which it is grounded (Pellegrinelli & Garagna, 2009; Hobbs et al., 2008). All these observations indicate that PMOs are inherently embedded in the surrounding contextual environment. This conclusion is supported and clarified by other studies. For example, Aubry et al. (2008) showed how PMOs evolve and are part of the organization's development process. Another study explains this evolvement by suggesting that organizational tensions are a major driver for change in PMO functions and structures (Hobbs et al., 2008). Taking all the important findings and observations from the existing studies, the following questions are asked: What are the elements in the context that affect the shape, form, and functions of a PMO and how should organizations design their PMOs?

Hobbs and Aubry (2007) proposed that PMOs need to adapt their functions to both organizational and strategic contexts. In their later article, Hobbs and Aubry (2008) studied the effects of organizational context on PMOs. From the eight proposed indicators, they found that the following four had statistically significant relationships with PMO characteristics: the type of project customers, form of organizational structure, level of project management maturity, and supportiveness of organizational culture. In addition, Pellegrinelli and Garagna (2009) emphasized the meaning of context in understanding the nature of PMOs through arguing, “PMOs are organization's responses to their needs and environments – unique structural arrangements designated to fulfil a specific purpose”. They proposed that the focal points of departure in understanding the form of PMOs are the nature of business in which the organization is engaged and the role of projects and programs in achieving business goals (Pellegrinelli & Garagna, 2009). The previously mentioned arguments seem to imply that the functions and structure of the PMO not only should but also need to be aligned with the logic of the organization's business in order for the PMO to be beneficial for the parent organization.

Chart 18. Overview of Studies on Project Management Offices

Study	Vital Contribution or Argument	Study Description
Hobbs & Aubry, 2007	• Identify 8 groups of functions based on 27 PMO functions: 1. Monitoring and controlling project performance 2. Development of project management competencies and methodologies 3. Multi-project management 4. Strategic management 5. Organizational learning 6. Execute specialized tasks for project managers 7. Manage customer interfaces 8. Recruit, select, evaluate, and determine salaried for project managers • It is not possible to classify PMOs in simple typologies • PMOs need to adapt to the organizational and strategic contexts	• Empirical study on structure, roles and perceived value of project management offices • Descriptive survey of 500 PMOs

Chart 19. Overview of Studies on Project Management Offices, Continued

Aubry et al., 2007	• Introduce the concept “organizational project management” that refers to “a new sphere of management where dynamic structures in the firm are articulated as means to implement corporate objectives through projects in order to maximize value” • PMO is a dynamic structure within organizational project management and part of the social innovation system • PMO’s performance is subjective hypothesis that is rooted in values and preferences of different stakeholders	• Literature review on strategic alignment, program and portfolio management, project-based organization, PMO and organizational performance • Conceptual study on organizational project management
Hobbs & Aubry, 2008	• Study shows PMOs differ in number of projects, number of project managers and they decision-making power on projects • PMOs with high decision-making authority, many projects and project managers tend be found in organizations with mature project management and supportive organizational culture • Results could not confirm a definite typology of PMOs	• Empirical study on PMO typology • Questionnaire survey, two samples • Samples 1: 500 PMOs • Sample 2: 123 PMOs

Chart 20. Overview of Studies on Project Management Offices, Continued

Hobbs et al., 2008	• PMOs as recent and important prodigy is interpreted as organizational innovations • PMOs are embedded in its host organization and the two co-evolve • Organizational tensions are primary force behind PMO implementation and reconfiguration • PMOs are part of the organizational political system	• Empirical study on creation and reconfiguration of PMOs as organizational innovation • Analysis of 11 organizational transformations in 4 organizations
Pellegrinelli & Garagna, 2009	• PMOs are organizational responses to their needs and environments • PMOs serve as agents and subjects to change and thereby create value for the organization • PMOs reflect outcomes of organizational commitments, agenda, and tensions • Relevant issues in understanding the nature of PMOs example organization's expectations of PMOs' benefits, nature of business, role of projects in the business	• Empirical study on PMO concept • Participating inquiries through organizational forum with representatives from 7 large organizations

(Dietrich et al., 2010)

The existing studies seem to emphasize that PMOs are inherently embedded in their surrounding organizational environment and co-evolve with the organization, Chart12. Even if it seems evident that there is a strong linkage between the PMO and its business context, there is still relatively little understanding of the mechanisms that connect organizational context to PMO functions and PMO

functions to the benefits that organization will gain from PMO functions. The existing understanding on change drivers behind PMO structure and services is important and valuable, but it does not provide necessary advice for organizations to design their PMOs in forms of PMO functions.

Furthermore, these 8 functions by priority (Hobbs & Aubry) are considered to determine the appropriate scope of the proposed PMO

9. Monitoring and control of project performance
10. Development of project management competencies and methodologies
11. Multi-project management
12. Strategic management
13. Organizational learning
14. Execution of specialized tasks for project managers
15. Management of customer interfaces
16. Recruitment, selection, evaluation, and determination of salaries for project managers

At the end of the maturity analysis, the results demonstrated the individual parameters to the organization's Lean Six Sigma maturity index achieved lower scores and are a matter of concern which require attention. Figure 13 which compares the scores for the individual parameters show that most of the bars represent the weaknesses of the organization and improvement opportunities for SLASPA. Moreover, it further deepened the need to develop the scope for the sucessful implementation of a PMO within the Engineering Department, and by extension SLASPA's. Further, the analysis of existing research on PMOs and their functions revealed that there is limited understanding on this subject and it does not provide clear and established guidelines for organizations to design their PMOs in terms of PMO functions.

Currently, the Engineering Department utilizes basic project management processes according to findings of this research. Additionally, stakeholder consultation revealed that the main reason SLASPA does not have a PMO yet is that it seemed like an unnecessary bureaucratic burden for the organization as there exist a team of Engineers in-house who also perform duties of project managers. Given the above argument which is primarily due to its maturity level currently being very low, the PMOs scope was developed through initial consultation with Stakeholders.

The perceived scope of the PMO is as follows:

- Monitor and tracking and Control Project
- Establish PM competencies and methodologies
- Project support for Multi-project Management

PMO Roles and Responsibilities extend to auditing or tracking ongoing projects at regular intervals to ensure projects are on course and follow the approved methodology. The PMO establishes a project management governance structure that includes key performance indicators and sets milestones for the project team. The PMO will track projects in a three-step cycle:

- Collection of Program Status Information, an update cycle of work plans, issues and changes, collected from project leads at routine intervals, usually every two weeks;
- Consolidation and analysis of the data collected from program status information, comparing results with baseline and communicating status to the management for review;
- Implementation of Corrective Action, if required, as decided by the management through the process of change management.

During the course of project tracking, the PMO has the responsibility to gather and archive project experience and reusable data to improve project management methods in the future. Monitoring and Controlling projects will involve tracking the actual project performance with the planned project management activities. It can

mainly be looked as a Control function that takes place at all stages of a project, that is, from initiation through closing. For small projects, monitoring and controlling project work is comparatively an easy task. However, PM is more stringently required for large projects where the project manager requires a formal effort to monitor and control how the processes are going. He or she will not be personally involved in performing project work in large projects.

Essentially, project controls are a series of tools that help keep a project on schedule. Combined with people skills and project experience, they deliver information that enables accurate decision making. The project control process mainly focuses on:

- Measuring planned performance verses actual performance.
- Ongoing assessment of the project's performance to identify any preventive or corrective actions needed.
- Keeping accurate, timely information based on the project's output and associated documentation.
- Providing information that supports status updates, forecasting and measuring progress.
- Delivering forecasts that update current costs and project schedule.
- Monitoring the implementation of any approved changes or schedule amendments.

Importance of project monitoring and control

Monitoring and control keeps projects on track. The right controls can play a major part in completing projects on time. The data gathered also lets project managers make informed decisions. They can take advantage of opportunities, make changes and avoid crisis management issues.

Put simply, monitoring and control ensures the seamless execution of tasks. This improves productivity and efficiency.

Monitoring and control method

When setting up a project's monitoring and control process, the PMO must first establish the project baselines. This includes the scope, schedule and budget. This information will be used to benchmark the project's progress throughout the lifecycle. Use of a Work Breakdown Structure (WBS) to break a project down into small units of work, or sub-tasks, as illustrated in Figure 16. This makes the work easier to manage and evaluate. This enables easier detection of issues, keeps the project under control and allows for easier progress verification. It also helps prevent team members from feeling overwhelmed. Once the WBS is done, the following project's lifecycle sequence highlighting throughout Figure 17 should be used:

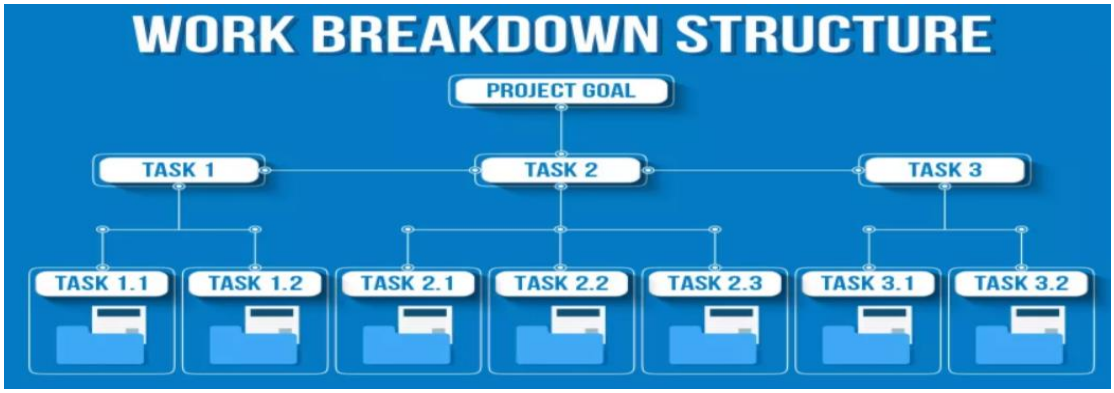

Figure 16. Proposed Work Break Down Structure Format (Project Monitoring and Control Techniques, 2019)

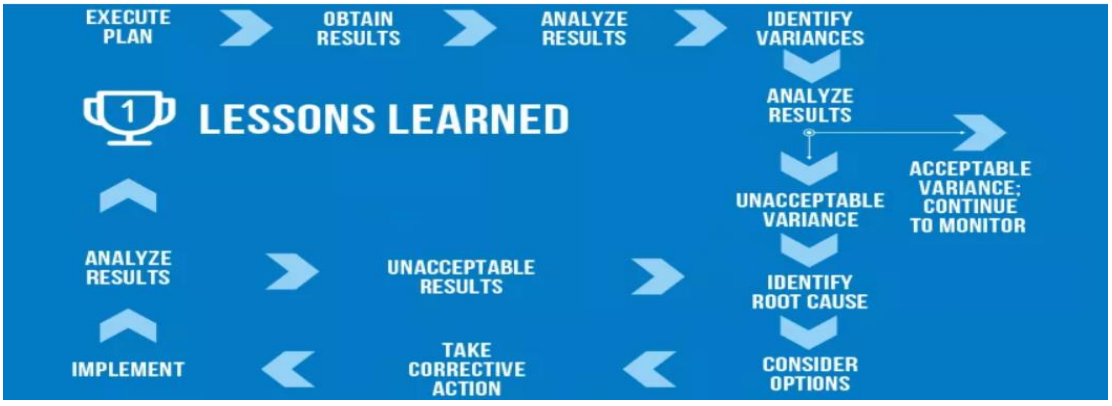

Figure 17. Project Lifecycle Sequence (Project Monitoring and Control Techniques, 2019)

One of the major PMO roles include providing a program baseline for implementation of a project. The PMO makes an estimate of the size of the project, the time and resources the project requires and lays down the project methodologies through many PMO tools and instruments:

- **Project Charter**: provides an overall vision of the program goals and objectives to the team members;
- **Work Plans**: lay down detailed schedules of activities, milestones, and deliverables of the project team, and identifies the resources available;
- **Governance Plan**: identifies the roles and responsibilities of each member of the project team;
- **Work Breakdown Structure**: defines the specific deliverables due from each team member, at each stage of the project;
- **Communication Plan**: establishes the protocol, procedure, and methods to communicate project information and issues among members of the team;
- **Forms and Templates**: simplify communication, record-keeping and reporting;
- **Risk Analysis**: lists out potential problems and chances of deviance from the project methodology, the probability of such occurrences, the possible impact, and possible solutions.

When preparing the program charter, the most critical of PMO responsibilities is to ensure that the project bases itself on accepted industry standard methodologies such as PMBOK Guide (PMI, 2017).

Three separate dimensions which are shown in Figure 18 are used for Project management competence and which consist of:

- project management knowledge competence—what the project manager knows about project management
- project management performance competence—what the project manager is able to do or accomplish while applying project management knowledge
- personal competency—how the project manager behaves when performing the project or activity.

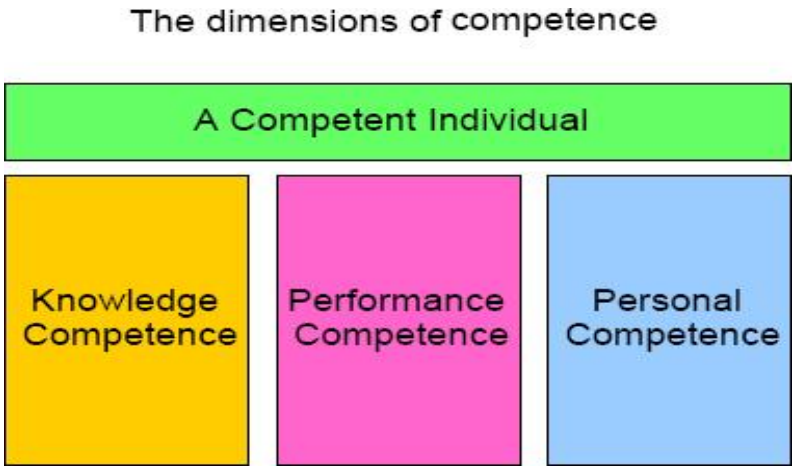

Figure 18. Project Dimensions of Competence (Cartwright, 2008)

To be recognized as fully competent, a project manager needs to be successfully evaluated against each of these dimensions. It would be impossible for project managers to be judged competent if they did not possess the expected combination of knowledge, performance, and personal competencies.

It is assumed that a project manager can demonstrate knowledge competence by sitting for and passing a suitable examination on the principles and practice of project management. An example is the PMI's Project Management Professional (PMP) certification.

The framework, as illustrated in Figure 19 then provides the detail to assess performance and personal competencies. The personal competency section

includes professional responsibility and ethics, and reflects project management personal competencies.

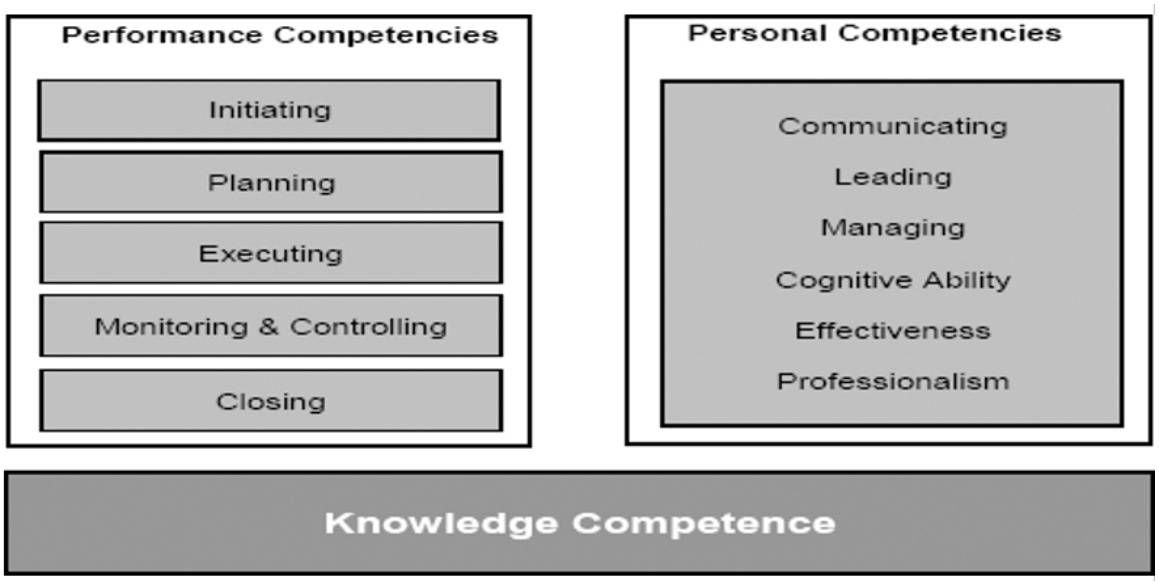

Figure 19. Knowledge Competence (Cartwright, 2008)

Performance Competencies

Once the structure of the performance competencies has been established by reviewing the PMP Exam Specifications, the initial document to define the competence units and then its elements is compiled and is illustrated in Figure 20.

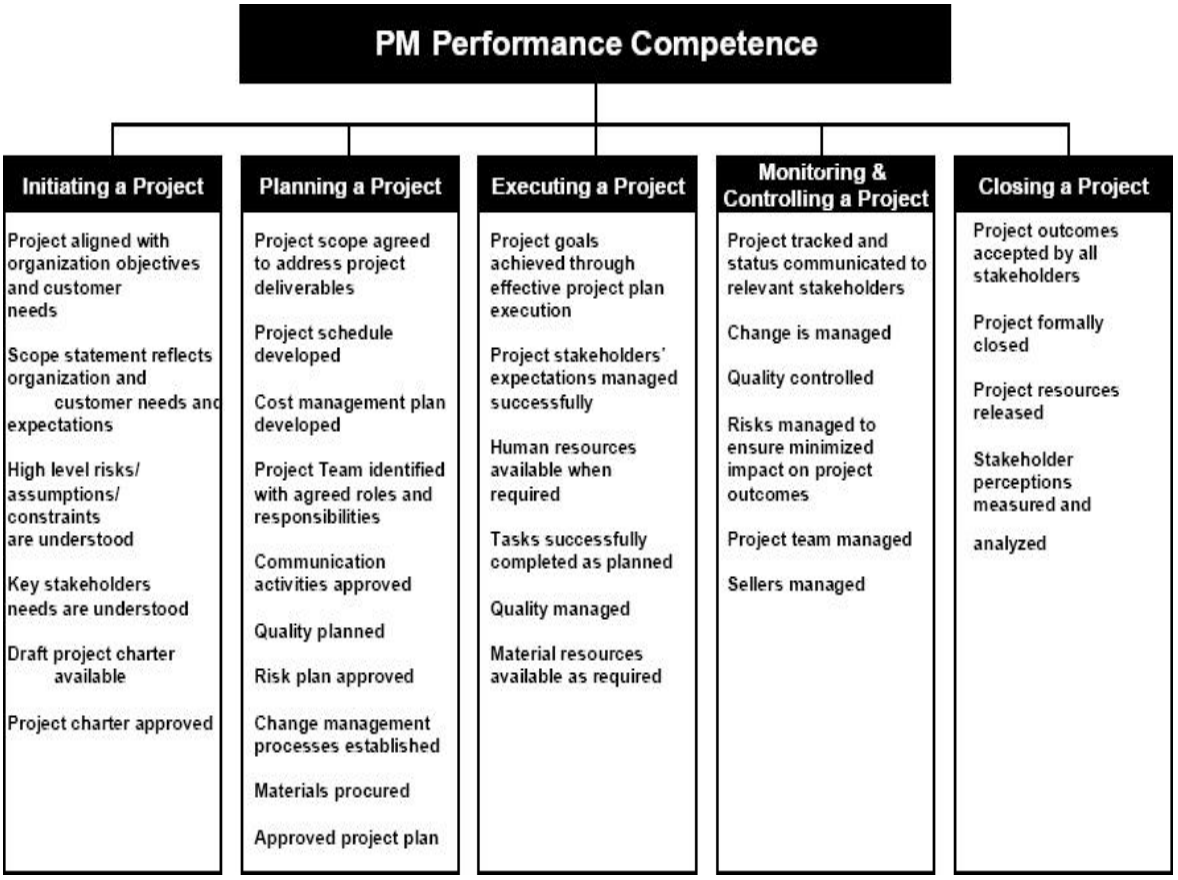

Figure 20. Performance Competence (Cartwright, 2008)

An output-oriented set of words was used to define each element. "What is the outcome required?" was asked. Then each element is broken down into performance criteria and evidence is developed for each, as in the illustrated example in Figure 21.

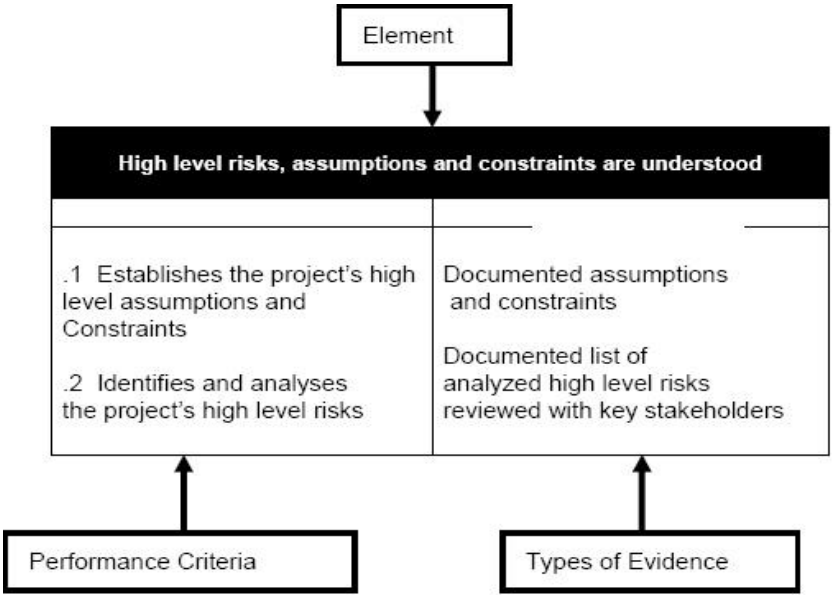

Figure 21. Example of Performance Competence (Cartwright, 2008)

Performance competence is demonstrated when an individual is able to provide evidence of meeting the performance criteria, normally concrete evidence such as project metrics to show compliance, feedback from a stakeholder, or a document the individual was responsible for preparing or approving. Normally there will be a one-for-one relationship between performance criteria and evidence when assessing performance competence. In most cases assessing performance competence is reasonably straight forward.

Personal Competencies

By contrast, personal competencies are more difficult to assess—there may be a one-to-many relationship with the evidence. There may appear to be many shades of grey as shown in Figure 22.

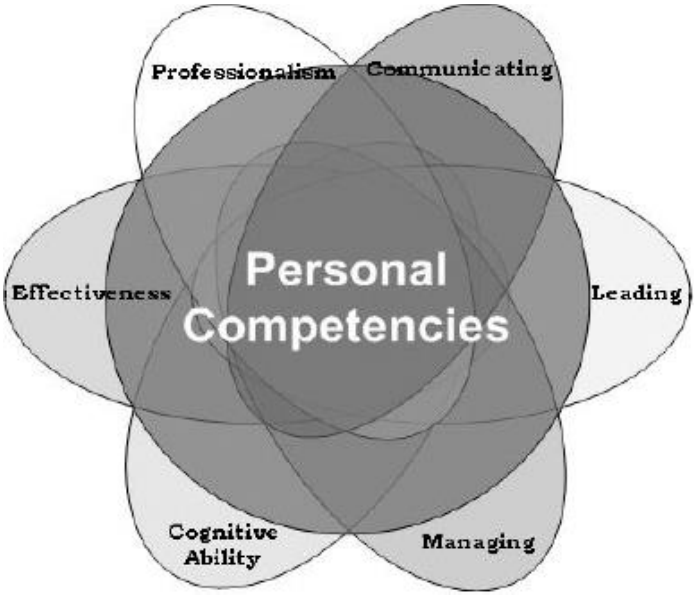

Figure 22. Personal Competence (Cartwright, 2008)

The framework in Figure 23 can be used as the basis defining the elements of personal competence to assess what behaviors are needed.

PM Personal Competence

Communicating	Leading	Managing	Cognitive Ability	Effectiveness
Actively listens, understands, and responds to stakeholders	Creates a team environment that promotes high performance	Builds and maintains the project team	Takes a holistic view of project	Resolves project problems
Maintains lines of communication	Builds and maintains effective relationships	Plans and manages for project success in an organized manner	Effectively resolves issues and solves problems	Maintains project stakeholder involvement, motivation, and support
Ensures quality of information	Motivates and mentors project team members	Resolves conflict involving project team or stakeholders	Uses appropriate project management tools and techniques	Changes at the required pace to meet project needs
Tailors communication to audience	Takes accountability for delivering the project		Seeks opportunities to improve project outcome	Uses assertiveness when necessary
	Using influencing skills when required			

Professionalism
Demonstrates commitment to the project
Operates with integrity
Handles personal and team adversity in a suitable manner
Manages a diverse workforce
Resolves individual and organizational issues with objectivity

Figure 23. Personal Competence (Cartwright, 2008)

When the elements are agreed upon, then it is broken down into performance criteria and provided types of evidence. An example is shown Figure 24.

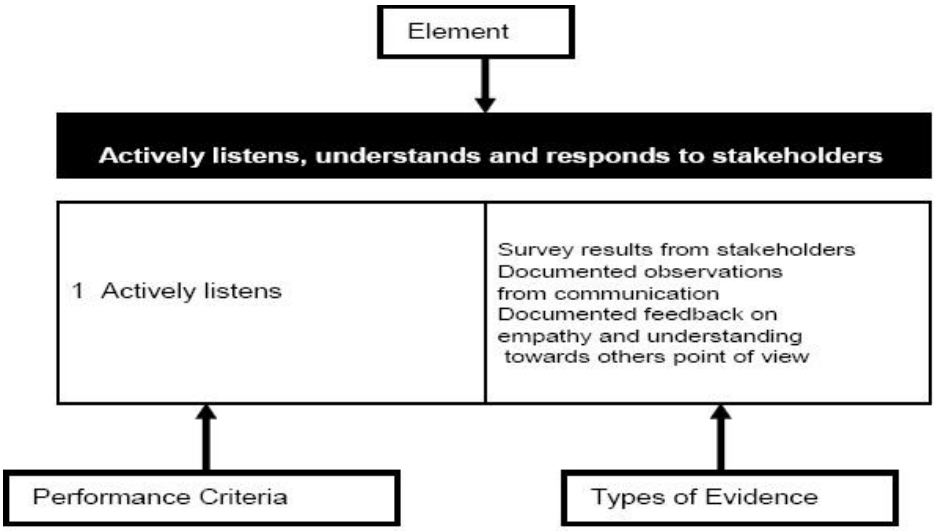

Figure 24. Example of Personal Competence (Cartwright, 2008)

The shape of the document grows very quickly when one realizes that for each dimension there are up to six units, each unit may consist of up to eight elements, and each element may have up to eleven defined performance criteria. The pyramid builds very quickly.

Plan Project Manager Competence Development

Once the assessment has been completed, a competence development plan must be developed. It is important for the plan to use the information gathered in the assessment to build on the strengths and to address the development needs of the individual project manager for the PMO. The results of the assessment must be addressed in a timely manner, as the assessment may identify items that need to be corrected immediately. Furthermore, the plan must be prioritized to address areas which are most critical to the individual, the Department and more so the organization. Once the areas have been prioritized, a realistic timeline for the plan must be established.

By focusing on the high priority items that require additional training, a more effective plan can be implemented. Just as a work breakdown structure is an effective way to decompose a large project into more manageable deliverables, the competence assessment helps to segregate the elements.

Addressing development needs can be done in a number of ways. This may depend on a number of aspects, such as available resources, cost, and time. Selecting the best method will require some analysis. The following are learning environments that may be used to address development needs:

- mentoring
- peer-to-peer
- role playing
- on-the-job training
- coaching
- group training
- in-house training
- Computer-based training
- individual training
- PMI-sponsored programs
    - PMI Global Congress
    - Seminars World
    - PMI eLearning
    - local chapter-provided educational opportunities
- public education
- conferences

Apart from defining, maintaining, and managing the project processes, PMO roles and responsibilities include providing support for the smooth execution of multiple projects.

- The PMO provides a centralized customer focused office that not only plan, negotiate and analyze projects, but also redress the project related concerns of the client, sponsor, and staff;
- The PMO develops a competent project manager through training and mentoring. Such project manager ensures that the implementation and maintenance of the project methodology and retain the team members' focus on the tasks in hand;
- The PMO provides training in project management and the applied project tools to team members;
- The PMO provides in-house consultancy services to the project team on project related issues.

Effective management of multiple projects is a daunting task even for a qualified project manager who knows about project management and for someone not properly trained in this field, it sounds impossible. In order to successfully manage multiple projects and meet deadlines, there are various strategies that can be adopted. Incorporating some of the following strategies in the PMO will ensure high performance and success, namely:

- Provide for an overview of all projects and resources. Stay on top of many parallel projects with central project lists, reports, and overviews.
- Use PMO for standards, processes and methods to increase project success.
- Prioritize initiatives and projects appropriately according to importance and urgency and in line with your corporate strategy.
- Be strategic in capacity planning. And ensure strategically relevant projects are implemented by qualified employees.
- Optimally support tactical resource planning with complete planning by the team leaders.
- Ensure transparency of cross-project dependencies.
- Simplify cross-project budget planning and cost tracking.

Provide for an Overview of All Projects and Resources

Keep track of the many parallel projects. The PMO will only succeed in this if a central database used once a certain number of projects have been reached. The central database will permit the PMO to produce reports as required for information or for informed decisions.

Figure 25 shows the different possible perspectives on the project portfolio. In addition to a central project list and resource overview, the illustration in Figure 25 also provides the following information on the portfolio of projects:

- Status reports
- Portfolio and pipeline overviews
- Risk matrix
- Resource and cost charts

These tools in Figure 25 can be used for controlling the individual projects: for resource coordination, project monitoring, and data exchange with the controlling department. When implementing such a central solution make sure, the information is tracked from the aggregated overview down to the smallest detail. It is better to start with limited functionality and build on that than to use maximum functionality and fail at the very beginning.

Hence, make portfolio meetings time-limited. It is impossible to look at all projects and resources each time. Therefore, make sure that the traffic light indicators are defined and other criteria that will allow effectively to filter the right projects and resources.

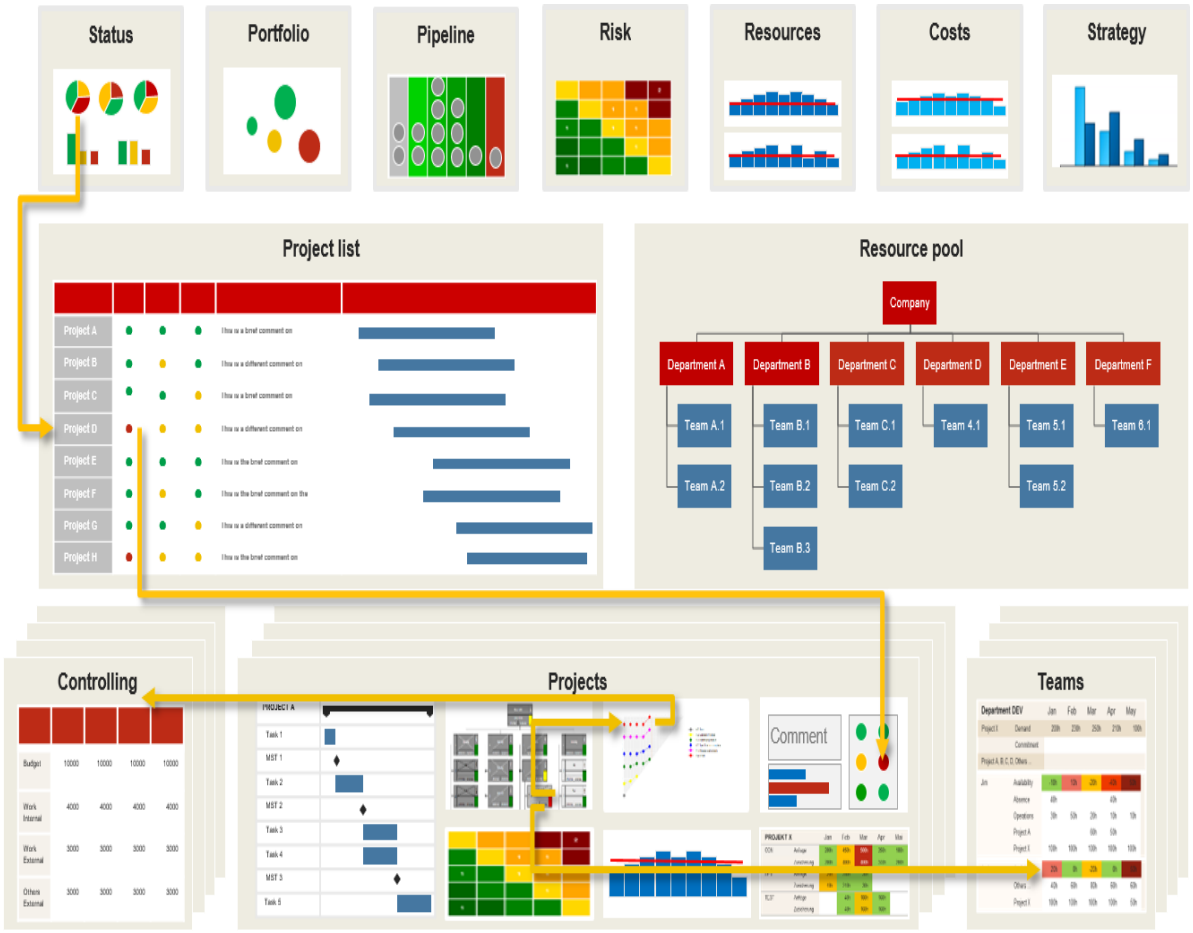

Figure 25. The central multi-project environment – Overview of the project portfolio from all perspectives (Strasser, 2020).

Use Your PMO for Standards, Processes and Methods

Projects have to meet certain standards in structure and setup to be administered efficiently. In addition, processes for planning and updating projects need to be defined.

As decisions have cross-project effects, controlling for all projects should follow the same intervals – using data that is as recent as possible. Project managers need to know what to do when. And how to do it. That is why the PMO will need the appropriate training and supervision.

The latter can be responsibilities of a PMO serving as a hub of communication between project managers, team leaders, decision-makers, and controllers. Figure

26 highlights the appropriate processes and high data quality that will enable a PMO to ensure professional multi-project controlling. The PMO should be responsible for the efficient flow of information and the continuous improvement of the maturity level. For instance, improvements can include:

- Supporting the roles involved
- Determining how projects are initiated
- Coordinating resource requests
- Ensuring reports are up to date, complete and plausible
- Establishing processes and methods
- Training project managers
- Introducing a suitable tool for project, portfolio and resource management

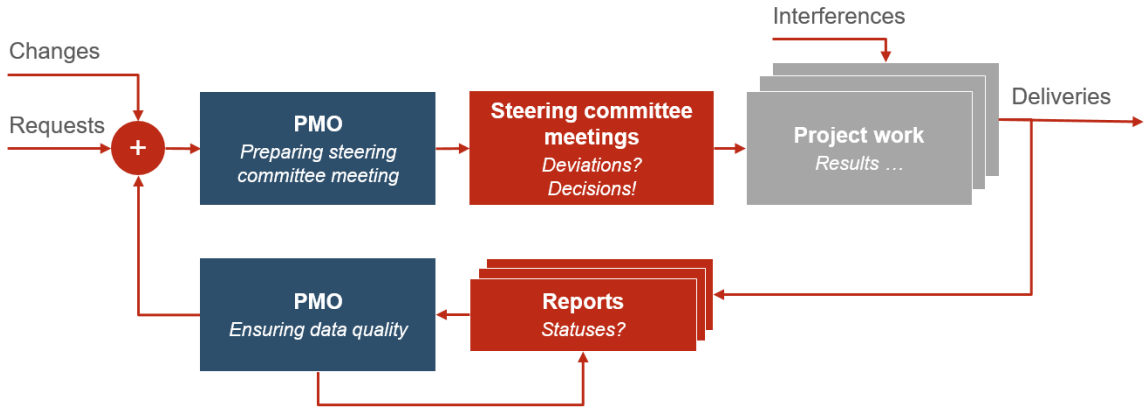

Figure 26. Processes that enable a PMO to ensure professional multi-project controlling. (Strasser, 2020)

The benefits of a well-established and accepted PMO should be:

- Time savings due to routine and training
- Decrease in project delays, costs and effort overruns
- Improved profitability of customer projects
- Reduction of resource conflicts
- Improved strategic direction of the projects

It is vital for the PMO to have backing from top management. However, it must not be perceived as a supervisory body. Instead, it has to give clear proof of its value to the project teams. This will ensure acceptance.

Prioritize Initiatives and Projects Appropriately

To avoid having to deal with too many projects at once, the PMO should concentrate on the important and urgent ones. Therefore, set priorities in line with corporate strategy. Start your projects according to these priorities.

Creating a decision matrix to differentiate between operations and different project types is recommended to make prioritization easier. Depending on the rating, the PMO will need to use different controlling methods. This is about expending administration and controlling effort appropriate to the size of the undertaking. The prioritization independent must be made of the project type. The use of the most resources for the most important projects should be utilized

Be Strategic in Capacity Planning

Strategic resource planning, also known as capacity planning, has one aim: the predictive allocation of employees with the necessary skills. It must also be ensured that the appropriate employees will be available at the right time to implement strategically relevant projects. With inadequate capacity planning you run risks such as:

- Projects are not finished on time due to insufficient resource allocation
- Project costs increase, as you are not using enough appropriate resources
- Business opportunities cannot be exploited, as the required skills could not be obtained on time
- Coordination efforts for resolving resource conflicts are significantly higher
- All of this can result in dissatisfied customers

Hence and as shown in Figure 27 a sample of predictive planning of a new project and the required resources with the aid of strategic capacity planning.

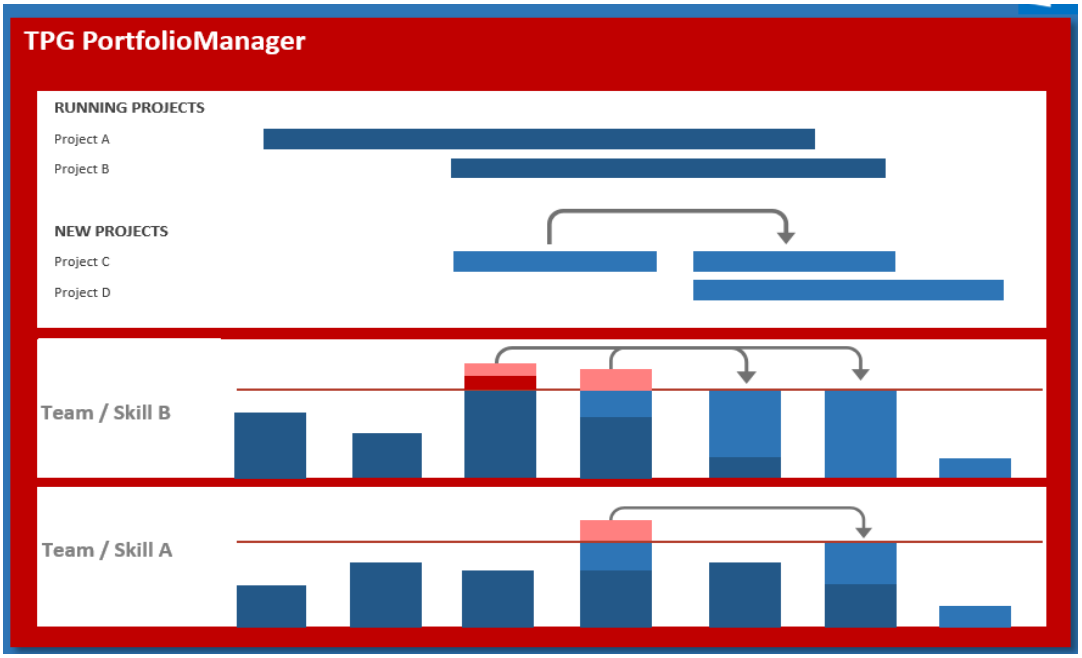

Figure 27. Sample of Predictive planning of new projects with the aid of strategic capacity planning (Strasser, 2020)

Strategic resource planning done properly can gain you a variety of benefits. These include for instance:

- Ensure that the most resources is reserved for the most important projects rather than for staffing unimportant ones
- Provide a complete overview of all resources, their project assignments and operations will keep you informed about the overall resource utilization
- Know which – and how many – new projects can be started and also carried out in addition
- Recognize resource bottlenecks in good time and are able to react to them in accordance with your corporate strategy
- Avoid many resource conflicts, as they never actually arise

For successful strategic capacity planning, a strong PMO with backing from top management is vital. In addition, a suitable tool environment is needed corresponding to the number of projects and resources.

Optimally Support Tactical Resource Planning

Tactical resource planning is the process of coordination between project manager and team leader. Project managers assign resources to the tasks of their projects. In doing so, it is hoped to actually get the team members they planned with. Where the resources that are planned with are deployed in the end, is the decision of the respective team leaders.

Resource planning is anything but easy for project managers and team leaders because:

- Efforts may not have been estimated as required
- Team members are not as interchangeable as initially assumed
- Project scope and delivery dates can change
- Absences due to illness tend to be unexpected

A general rule for resource planning is: Only complete planning is good planning. To achieve this, the following points must be marked:

- Planning can be considered complete once each team member's absences, operations and project assignments have been recorded
- Only team leaders are able to plan completely for their team members; project managers lack this insight
- Project availability is determined by looking at the capacity minus absences and operations
- Planning project assignments differs between line and matrix organizations.

Better to be complete and slightly unspecific in planning than specific but incomplete. Only complete planning is good planning. And get use to the idea that resource planning will not always be 100 per cent specific. Outside interferences tend to come before you can adjust your planning.

Ensure Transparency of Cross-Project Dependencies

The steering committee for multi-project management or programs issues its targets at regular intervals. This includes, for instance, directives concerning the important milestones at the interfaces. These targets are allocated to the corresponding projects (top-down). And the project managers have to implement them.

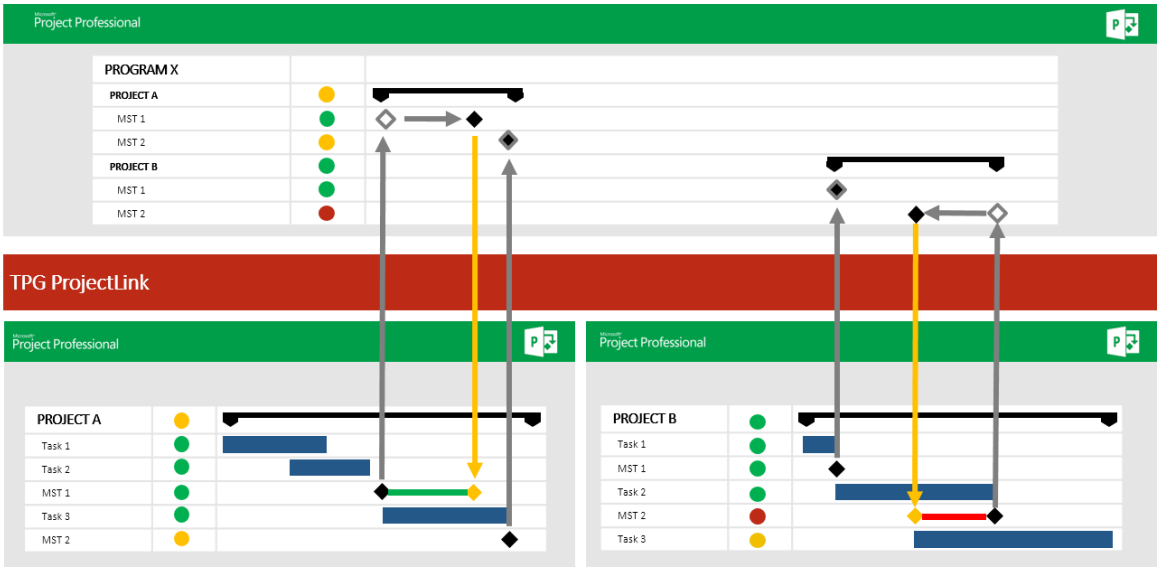

Figure 28. Sample of Bottom-up and top-down control between program plan and individual project plans (Strasser, 2020)

Hence, use soft links between the tasks of different projects. These have the advantage that project managers can see the resulting scheduling conflicts directly when making changes, as shown is Figure 28. However, this happens without changing their own plan, which is important. After all, project managers stay in control of their own planning.

Simplify Cross-Project Budget Planning and Cost Tracking

In performing their tasks, project managers and controllers are reliant on each other's data. This makes it necessary to integrate both their systems. Without an automatic transfer of data in both directions, two things would be impossible:

- Timely monthly billing

- Prompt distribution of remaining budgets between the projects

The advantages of such an integration are as follows:

- No dual data entry
- Timely provision of data
- High data quality

Strategic objectives is one of the main stakeholders at SLASPA, where management keeps watching how each project is feeding results into the overall strategy progress. The organization emphasizes the project's strategic benefit in order to help project managers in the Engineering Department find the right answer.

Although KPIs are a general trend to drive behaviors within the organization, it is best to be shown as one of the strategic planning outputs in order to link performance of the PMO level to the total performance on the organizational level. KPIs help build the value of/for an organization.

KPIs are the messengers of the organization's strategic objectives if the PMO is the strategy guard and implementer. KPIs can meet and walk together in two ways as shown inf Figure 29. The first direction is top-down. Here management thinks of the PMO as KPI enablers, which is why the targeted KPI must be present in the PMO and choosing projects. The organization knows how this PMO would help the organization achieve its KPIs. When a project goes on and has some performance information, the PMO measure it according to pre-defined KPIs and then send it bottom-up (the second way) to feed the general KPIs.

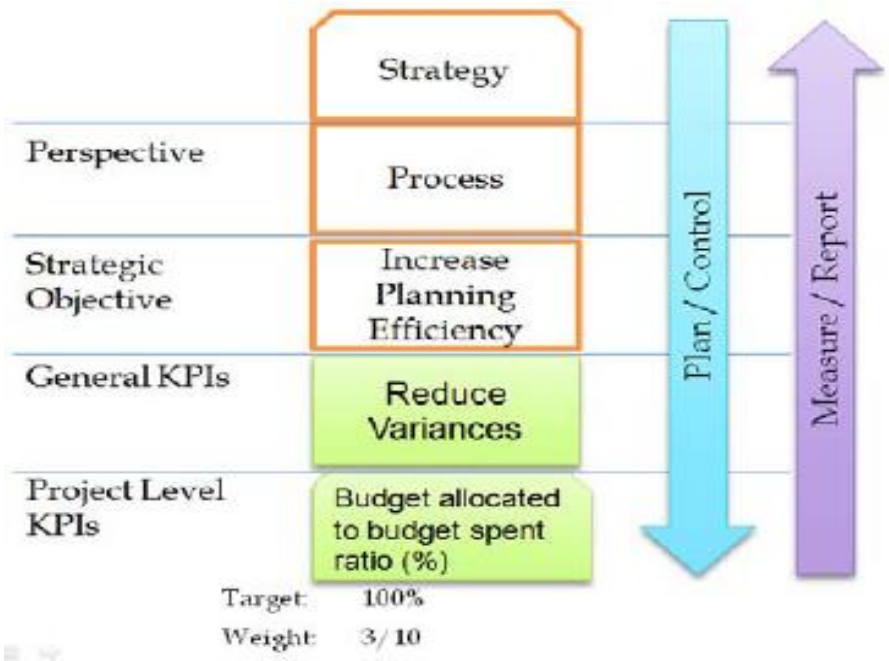

Figure 29. Linking Project KPIs to General KPIs During Planning and Reporting (Alsadeq & Hakam, 2010)

The PMOs key performance indicators (KPI's) can be defined as an agreed set of indicators that, if achieved, validates that the PMO has achieved what is was set-up for. (PMO KPI's, 2018) Time and effort were spent defining a good set of meaningful KPI's that will delivered value to the PMO. These KPI's that are chosen to measure the success of a PMO are based on alignment to the objectives and my organization, SLASPA. The performance measurements were also used to guide the development of the KPIs. Hence, the recommended PMO KPI's are as follows:

- Deliver no less than 80% of projects delivered by the end of the respective financial year.
- Deliver no less than 90% of projects delivered in-line with the organization's strategic objectives by the end of the respective financial year.
- Fail to deliver less than 5% of projects by the end of the respective financial year.
- Submit benefits realized against Benefit forecast report for next year by the end of each respective year.
- Ensure Simple Return on Investment (ROI) for all projects the PMO has oversight within each respective year.

- Submit Resources added against Resource forecast for next year by the end of each respective year.

It is hereby recommended that these KPI's be compared with previous years, upon it second year in implantation. This recommendation will then demonstrate the positive impact the PMO is having against each of the indicators. Based on the above, the following action plan is recommended to finalize the PMO KPI:

- Spend time to figure out what would be the most meaningful indicators for the PMO and the organization as a whole.

- Ensure that the KPI's are agreed with the appropriate stakeholders. This includes agreeing what needs to be evidence to demonstrate achievement. It is recommended that this be done at the start when it will be less emotive.

- Plan for a method of tracking the KPI's and putting processes in place to collect the data. It is also recommended that there may be a need to capture historic data, if available, in order to be able to demonstrate year on year trends.

- Design a dashboard that clearly shows the performance against KPI's. This will become a very powerful section in the PMO management report.

- Collect and validate the data on a regular basis. Review the data and if performance is not looking as good as previous s, act early to get back on track.

5. CONCLUSIONS

The Engineering Department is one of the most critical departments within SLASPA primarily because it is responsible for overseeing and ensuring a high level of efficient technical engineering competencies throughout its facilities, in the pursuit of the numerous port infrastructural developments. The Engineering Department on an average manages and implements 80% of SLASPA's projects (both capital and recurrent) on an annual basis. The Engineering Department is also required to execute an increasing number of projects upon request from SLASPA's stakeholders. Currently, the same team that manages maintenance is also responsible for the management and implementation of projects. At present the Engineering department utilizes basic project management processes according to findings of this research. The Engineering Department in the absence of a PMO has resulted in a low rate of project implementation.

The level of maturity assessment of SLASPA's Engineering Department was conducted utilising scorecards modelled from the Lean six sigma methodology. The objective of the Maturity assessment was to determine the Engineering Department's project management strategy, strengths, weaknesses and areas of improvement. Based on the results obtained from the maturity assessment which directed the selection of the best appropriate PMO for the Engineering Department, the following was concluded:

1) Average overall maturity index of 1.67 on a 5-point scale was obtained from the maturity level assessment exercise. The average index of 1.67 points corresponds to a maturity level 1.67 which is below the acceptable 2.5 organizational lean maturity index. This index reading is very low in the maturity level on the six sigma scale of the maturity level classification. Consequently, this low rating of 1.67 highlights that every category was poorly rated in this exercise, with the exception of leadership alignment as is interpreted in the Chart 11. The results also demonstrated the strengths, weaknesses and improvement opportunities of the Engineering Department,

and by extension SLASPA. The most urgent categories to address are lowest rated categories. Moreover, it further deepened the “why” the Engineering Department, and by extension SLASPA needs a PMO. Based on the gap analysis shown in Figure 11 highlighting the key parameters for improvement by key stakeholders in the organization one can begin addressing the weaknesses and start the process of addressing them.

2) It is difficult to analyze a PMO without a typology (supporting, controlling and directive). The analysis of the three PMO types it was apprehended that, each type of PMO has its function and impact based on the type of organization, its structure, its culture and most importantly, what its objectives are for the overall success of that organization.

3) As it pertains to this research, SLASPA’s structure and culture unquestionably requires a PMO. This is vastly based on the outcomes from the stakeholders highlighted in Chart 12 of the results chapter. The general consensus among the stakeholders was for the Engineering Department to have the full characteristics of a traditional supporting PMO with a strong compliance governance characteristic of a controlling PMO.

4) Hence, based on the results and the analysis of different PMO types based on the current Engineering status and SLASPA’s culture, a **hybrid** of two PMOs (supporting & controlling PMOs) was selected. The use of the results of the maturity assessment and the current operational culture of the Engineering Department, coupled with the functions of the two types of PMOs (Controlling and Supporting), it was comprehended that a merger of both are best suited.

5) A Directive structure PMO would not be suitable based on the consultation exercise with the key stakeholders, it was comprehended that SLASPA, and more specifically the Engineering Department did not want to surrender

absolute control of its current modus operandi. The overall consensus articulated was that the organization has a preference to be supported by the provision of an expertise within the Engineering Department. Linking the results of the assessments conducted and the weaknesses identified from the maturity assessment further highlights the argument for choosing a PMO.

6) The analysis of the different types of PMO also revealed that the Engineering Department at this point of its maturity could not embark on a Directive PMO and this is primarily due to its maturity level currently being very low. It was assumed that a Directive PMO might be required when the Engineering Department obtains a maturity level of 4 or 5 (with 5 being the highest maturity level).

7) The results of the interviews conducted for this research highlighted that there is resistance from senior management, with the exception of Engineering, to directly be responsible for the PMO. It was also the consensus of most of the stakeholders that a major setback for the organization is that there is a lack of personnel for direct project management and that the Engineering Department should sustain the responsibility to control an independent body to manage it. Hence, independent personnel be set up to administer, evaluate the capital projects management mandated of the organization

8) The PMO will be located within the Engineering Department. The PMO is recommended to be staffed by one full-time Project Manager and coordinate the work of the Engineering Departmental projects and the staff who manage these projects as part of their regular duties.

9) The vision and mission of the PMO was developed with SLASPA's organizational goals in mind. The mission of the PMO is to provide an enterprise-wide approach to identify, prioritize, and successfully execute an Engineering portfolio of initiatives and projects that are aligned with SLASPA's

organizational strategic goals and vision. The PMOs primary responsibility is to manage and control project constraints by ensuring project plans are implemented on schedule, within scope, and budget. Project management leadership is responsible for establishing and implementing best practices for the benefit of SLASPA in a way that encourages collaboration, standardization, and overall improvement in our organization.

10) The PMOs vision is to Support departments, staff, and SLASPA's port communities as a source for project management leadership and expertise; promote best practice standards, quality, and methodologies into a project management discipline; utilize PMBOK Guide-based methodology as well as support "best fit" approach for project management in Engineering; provide a channel of communication for project status, financial health, mitigation of issues, risk, and dependencies across projects and departments; and build project management maturity at the organizational level.

11) The Objectives of the PMO are as follows:

    a. Using the proper methodologies and best practices standards to ensure successful completion of the project.

    b. Manage the Engineering Department projects portfolio.

    c. Keep SLASPA's executive management and the relevant Heads of Department informed on all project's status.

    d. Serve as the Engineering Department's authority on Engineering Project Management practices.

    e. Build Project Management maturity at the departmental level.

12) Existing research and studies have put enormous efforts into defining and clarifying the concept of PMO. The fact that researchers have not been able to develop a unified and commonly accepted definition for a PMO reflects the complexity of the phenomenon that is studied. Existing studies seem to emphasize that PMOs are inherently embedded in their surrounding organizational environment and co-evolve with the organization. Even if it seems evident that there is a strong linkage between PMO and its business context, there is still relatively little understanding of the mechanisms that connect organizational context to PMO functions and PMO functions to the benefits that organization will gain from PMO functions. Further, the 8 functions by priority (Hobbs & Aubry) are considered to determine the appropriate scope of the proposed PMO, namely: monitoring and controlling project performance; development of project management competencies and methodologies; multi-project management; strategic management; organizational learning; executing specialized tasks for project managers; manage customer interfaces and lastly recruit, select, evaluate, and determine salaried for project managers.

13) The scope of the PMO is monitor and tracking and Control Project; establish PM competencies and methodologies and project support for Multi-project Management.

6. RECOMMENDATIONS

Based on the research and results conducted of the current muturity status of Slaspa's Engineering Department and it's potential areas of improvement, the following are recommended:

1) The Engineering Department implement a PMO on its organizational structure to optimize the results of successful future projects. The simple reason is that Stakeholders generally show a lack of confidence in the status quo yet are unaware of some of the basic project management processes. Due to the current COVID-19 pandemic, the organization is currently not in a good financial position and needs structural assistance moving forward.

2) Upon the implementation of the new PMO that a routine review program be established to assess the needs of the PMO, its project management strategy; strengths, weaknesses and areas of improvement, preferably annually by the PMOs Project Manager. This is done to assess its efficiency and relevance to allow guidance to management and SLASPA stakeholders if and when the PMO based on its projects demands would be better served with another PMO type.

3) Maturity assessment should be conducted by the PMO through the Chief Engineer and management by the project manager at least every three (3) years. This will be done in order to update on the status of the PMO and to further determine the strategic purpose of the PMO and its scope. The PMO shall be responsible for these assessments.

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9. APPENDICES

Appendix 1: FGP Charter

PROJECT CHARTER Formalizes the project start and confers the project manager with the authority to assign company resources to the project activities. Benefits: it provides a clear start and well defined project boundaries.	
Date	**Project Name:**
22 June 2020	To Plan a Project Management Office for the Engineering Department of the St. Lucia Air and Sea Ports Authority (SLASPA)
Knowledge Areas / Processes	**Applicacion Area (Sector / Activity)**
Knowledge Areas: Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communication Management, Project Risk Management, Project Procurement Management, Project Stakeholder Management. **Process groups:** Initiating, Planning, Executing, Monitoring & Control, Closing.	Construction
Start date	**Finish date**
Is the same as the issue date	24 January 2021
Project Objectives (general and specific)	
General objective: To develop a Project Management Office proposal for the Engineering Department of the Saint Lucia Air and Sea Ports Authority (SLASPA). **Specific objectives:** 1. To assess the needs of Engineering Department, to determine its project management strategy ; strengths, weaknesses and areas of improvement. 2. To analyze the different PMO types and select the best option for the department. 3. To determine the strategic purpose of the PMO. 4. To develop the scope of the PMO for the Engineering Department.	
Project purpose or justification (merit and expected results)	
Over the years, the Engineering Department has been required to execute an increasing number of projects upon request from Slaspa internal stakeholders. Further, there is also a growing/increasing demand for major maintenance projects due to Slaspa's aging facilities. However, the same team which manages maintenance is also responsible for capital projects. Hence, the purpose of this project is to create the framework for a PMO to successfully manage and implement all capital projects for the organization for each given financial year. The PMO will be directly responsible for effectively managing all capital project. The expected result is to develop documentation and templates through a PMO that would enable the efficient management of project that would result in a high implementation rate.	
Description of Product or Service to be generated by the Project – Project final deliverables	
1. PMO Application documents for managing capital project for the organization. 2. PMO strategic purpose, scope, and suites of measurable indicators to evaluate project outcomes.	

Assumptions

The formal knowledge gained from the Master's in Project Management program is sufficient to complete the execution of the final graduation project by the student.
Review and feedback of the project deliverables to be done in a timely manner.
The facts assumed to be true for planning purposes of this project will be generated using information, data and experiences gathered from the Engineering Department and SLASPA internal stakeholders.

Constraints

Due to time constraints, the scope of this project would be reduced solely to meet this academic endeavor. The research shall continue beyond.

Preliminary risks

If permission and access to the required information/documentation is hindered in any way during the research period, this might impact the delivery time and subsequent quality of the project. If supervisory support is not adequately available, it can lead to a delay impacting the scope, time, cost and quality of the project.

Budget

The cost of this project has not yet been established.

Milestones and dates

Milestone	Start date	End date
FGP Charter	22 June 2020	28 June 2020
FGP Work Breakdown Structure (FGP WBS)	22 June 2020	28 June 2020
Weekly self assessment	22 June 2020	28 June 2020
Corrections	29 June 2020	5 july 2020
Introduction chapter	29 June 2020	5 july 2020
FGP schedule	29 June 2020	5 july 2020
Weekly self assessment	29 June 2020	5 july 2020
Corrections	6 July 2020	12 July 2020
Theoretical framework chapter	6 July 2020	12 July 2020
Corrections	13 July 2020	19 July 2020
Methodological framework chapter	13 July 2020	19 July 2020
Corrections	20 July 2020	26 July 2020
Executive summary	20 July 2020	26 July 2020
Bibliography	20 July 2020	26 July 2020
Signed charter	20 July 2020	26 July 2020
Final Graduation Course	5 Septmeber 2020	24 January 2021

Relevant historical information

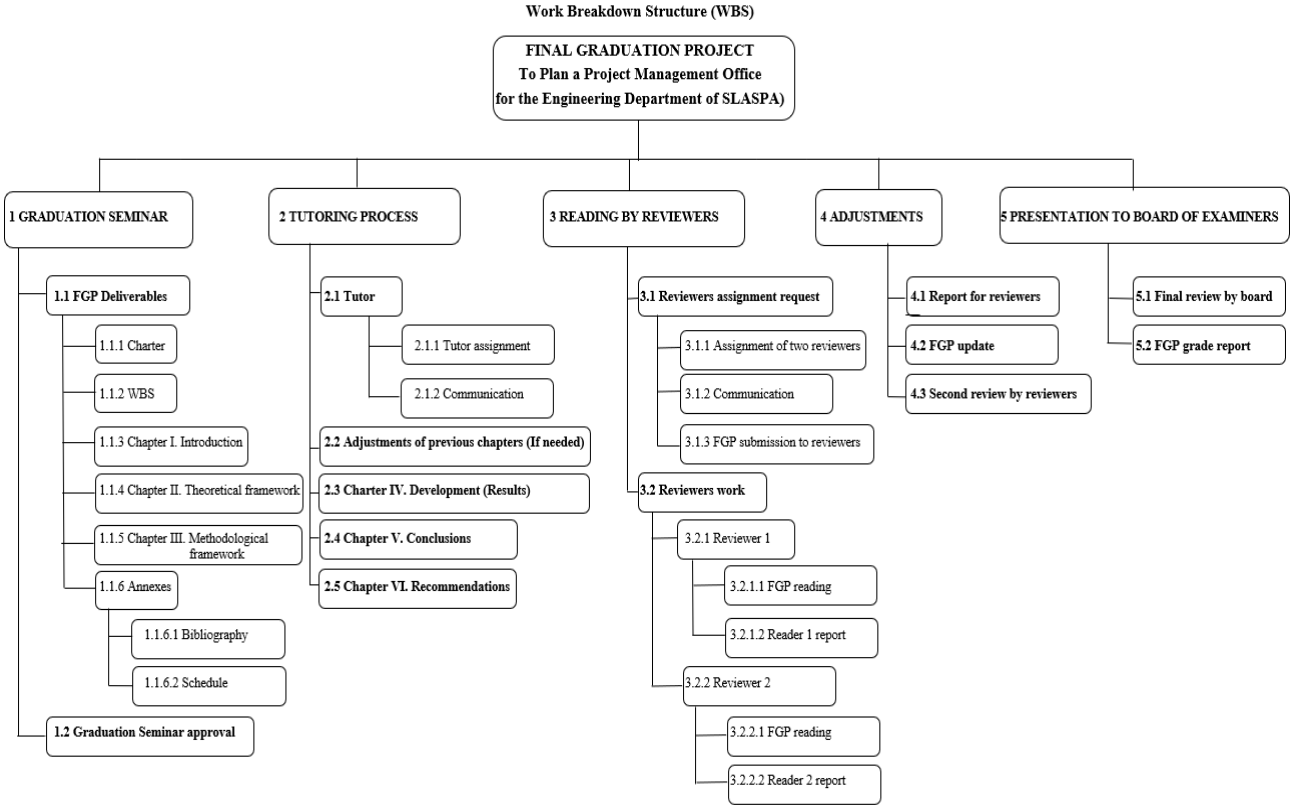
The Saint Lucia Air and Sea Ports Authority (SLASPA) was established by an Act of Parliament, No. 10 of 1983. This Act brought together the Civil Aviation Department of the Ministry of Communications and Works and the Port Authority. SLASPA is responsible for managing and providing a high level of quality service at the main ports of entry to the island including two principal seaports, Castries and Vieux Fort, and the George F.L. Charles and Hewanorra International Airports, as well as the smaller points of entry: Soufriere, Marigot, and Rodney Bay Marina.

Operating from its headquarters in Castries, SLASPA has a unique position for the island by providing avenues to generate initiatives for maximizing the assets held in its name and to offer value-added services to its clientele. SLASPA is managed by a team of professionals headed by a General Manager, and reports to the Council, which comprises ten (10) persons appointed by Government.

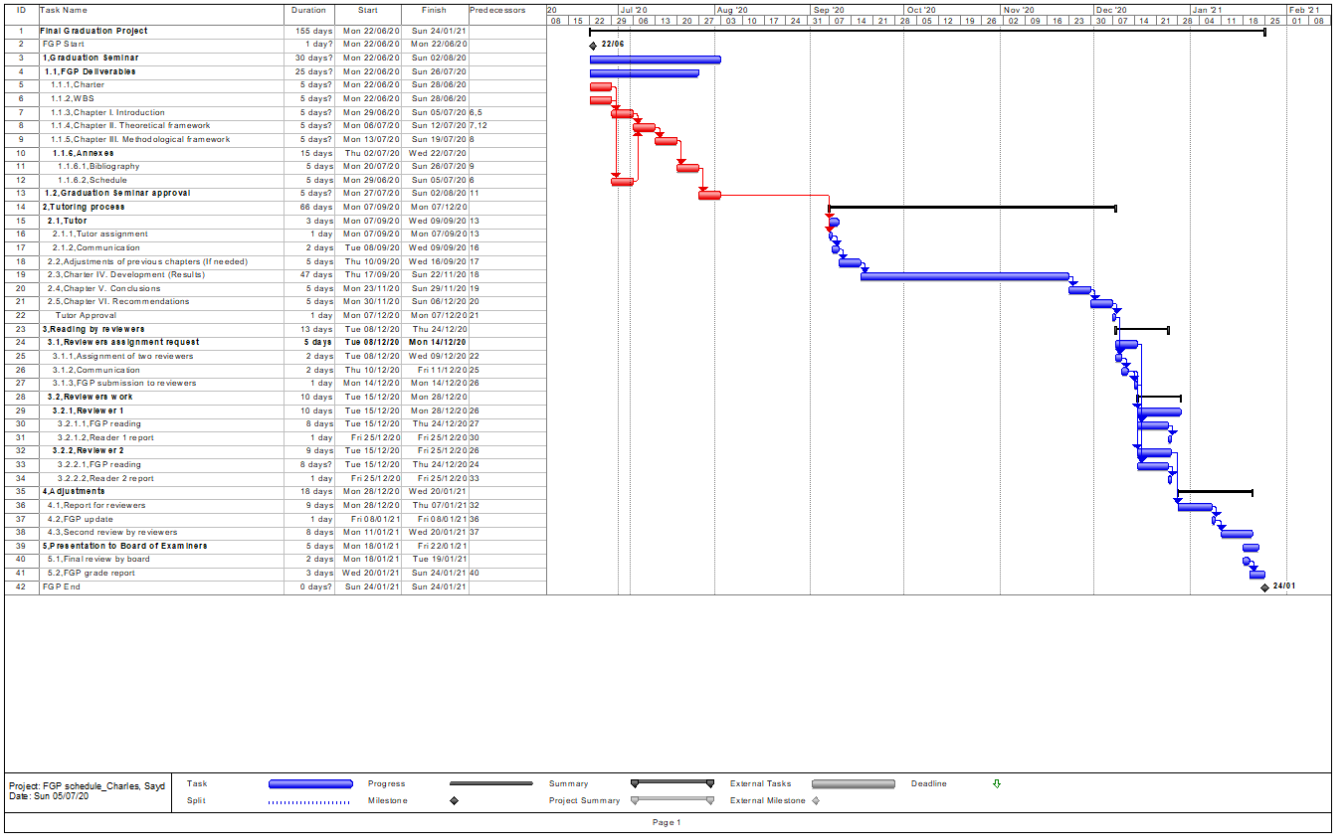
Its mission is a noble one: To facilitate trade and travel through value creation in a safe, secure and customer-centric environment for sustained social and economic development; with a vision: To be a modern gateway connecting people, partners and the world.

Stakeholders	
Direct stakeholders: Engineering Department **Indirect stakeholders**: All other departments including Air and Sea Ports, Accounts-Procurement, Executive Management, etc.	
Project Manager: Saydia Charles	**Signature:**
Authorized by:	**Signature:**

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



ID	Task Name	Duration	Start	Finish	Predecessors
1	**Final Graduation Project**	155 days	Mon 22/06/20	Sun 24/01/21	
2	FGP Start	1 day?	Mon 22/06/20	Mon 22/06/20	
3	**1,Graduation Seminar**	30 days?	Mon 22/06/20	Sun 02/08/20	
4	**1.1,FGP Deliverables**	25 days?	Mon 22/06/20	Sun 26/07/20	
5	1.1.1,Charter	5 days?	Mon 22/06/20	Sun 28/06/20	
6	1.1.2,WBS	5 days?	Mon 22/06/20	Sun 28/06/20	
7	1.1.3,Chapter I. Introduction	5 days?	Mon 29/06/20	Sun 05/07/20	6,5
8	1.1.4,Chapter II. Theoretical framework	5 days?	Mon 06/07/20	Sun 12/07/20	7,12
9	1.1.5,Chapter III. Methodological framework	5 days?	Mon 13/07/20	Sun 19/07/20	8
10	**1.1.6,Annexes**	15 days	Thu 02/07/20	Wed 22/07/20	
11	1.1.6.1,Bibliography	5 days	Mon 20/07/20	Sun 26/07/20	9
12	1.1.6.2,Schedule	5 days	Mon 29/06/20	Sun 05/07/20	6
13	**1.2,Graduation Seminar approval**	5 days?	Mon 27/07/20	Sun 02/08/20	11
14	**2,Tutoring process**	66 days	Mon 07/09/20	Mon 07/12/20	
15	**2.1,Tutor**	3 days	Mon 07/09/20	Wed 09/09/20	13
16	2.1.1,Tutor assignment	1 day	Mon 07/09/20	Mon 07/09/20	13
17	2.1.2,Communication	2 days	Tue 08/09/20	Wed 09/09/20	16
18	2.2,Adjustments of previous chapters (If needed)	5 days	Thu 10/09/20	Wed 16/09/20	17
19	2.3,Charter IV. Development (Results)	47 days	Thu 17/09/20	Sun 22/11/20	18
20	2.4,Chapter V. Conclusions	5 days	Mon 23/11/20	Sun 29/11/20	19
21	2.5,Chapter VI. Recommendations	5 days	Mon 30/11/20	Sun 06/12/20	20
22	Tutor Approval	1 day	Mon 07/12/20	Mon 07/12/20	21
23	**3,Reading by reviewers**	13 days	Tue 08/12/20	Thu 24/12/20	
24	**3.1,Reviewers assignment request**	**5 days**	**Tue 08/12/20**	**Mon 14/12/20**	
25	3.1.1,Assignment of two reviewers	2 days	Tue 08/12/20	Wed 09/12/20	22
26	3.1.2,Communication	2 days	Thu 10/12/20	Fri 11/12/20	25
27	3.1.3,FGP submission to reviewers	1 day	Mon 14/12/20	Mon 14/12/20	26
28	**3.2,Reviewers work**	10 days	Tue 15/12/20	Mon 28/12/20	
29	**3.2.1,Reviewer 1**	10 days	Tue 15/12/20	Mon 28/12/20	26
30	3.2.1.1,FGP reading	8 days	Tue 15/12/20	Thu 24/12/20	27
31	3.2.1.2,Reader 1 report	1 day	Fri 25/12/20	Fri 25/12/20	30
32	**3.2.2,Reviewer 2**	9 days	Tue 15/12/20	Fri 25/12/20	26
33	3.2.2.1,FGP reading	8 days?	Tue 15/12/20	Thu 24/12/20	24
34	3.2.2.2,Reader 2 report	1 day	Fri 25/12/20	Fri 25/12/20	33
35	**4,Adjustments**	18 days	Mon 28/12/20	Wed 20/01/21	
36	4.1,Report for reviewers	9 days	Mon 28/12/20	Thu 07/01/21	32
37	4.2,FGP update	1 day	Fri 08/01/21	Fri 08/01/21	36
38	4.3,Second review by reviewers	8 days	Mon 11/01/21	Wed 20/01/21	37
39	**5,Presentation to Board of Examiners**	5 days	Mon 18/01/21	Fri 22/01/21	
40	5.1,Final review by board	2 days	Mon 18/01/21	Tue 19/01/21	
41	5.2,FGP grade report	3 days	Wed 20/01/21	Sun 24/01/21	40
42	FGP End	0 days?	Sun 24/01/21	Sun 24/01/21	