

**UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)**

SETTING UP A PMO
for Prudy's Construction Services Ltd- St. Lucia

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APPROVAL PAGE

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This Final Graduation Project was approved by the University as
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DEDICATION

This work is dedicated to my family, friends and loved ones who in many ways supported me through the development of this work, and to Prudy's Construction Services Ltd, for serving as the model for this thesis.

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ABBREVIATIONS AND ACRONYMS

- AC Actual Cost
- CI Continuous improvement
- CMMI Capability Maturity Model Integration
- CPk Capabilities Index
- FGP Final Graduation Project
- OPM3 Organizational Project Management Maturity Model
- P3M3 Portfolio, Program & Project Management Maturity Model
- PCSL Prudy's Constructions Services Limited
- PF Planned Finished date
- PM Project Manager
- PM Project Management
- PMI Project Management Institute
- PMBOK Project Management Book of Knowledge
- PMO Project Management Office
- ROI Return on Investment
- WBS Work Breakdown Structure

EXECUTIVE SUMMARY (ABSTRACT)

The principal goal of this research is to create a profit generating potential for a medium sized construction company through project management frameworks, using the benefits of a Project management office (PMO) on the company's organizational structure. The first decision is to identify Prudy's Construction Services Limited (PCSL) as the model company on which this research was conducted. Then the research began with a maturity assessment as a pre-requisite criterion for setting up a PMO. The assessment was conducted through a questionnaire. Twelve (12) questions covering twelve (12) predetermined six-sigma evaluation categories. The participants were key PCSL stakeholders and employees.

Prudy's Construction Services Limited (PCSL) is currently a medium size construction company that, prior to 2013, operated under the name Prudence Montrope. Mr. Montrope (Director) had over 25 years' experience in the construction industry and started with an average of ten (10) persons, mostly as a subcontractor under NH International. From 2008 onward, PCSL faced very serious financial challenges occasioned by the economic recession, which affected the construction industry worldwide. In 2013, PCSL was awarded a multi-million dollar contract from which the eminent demand for a proper and formal restructuring of the company to operate as a fully-fledged construction company became more critical than ever before.

The imminent problem is the non-existence of Project Management Practices and skills, which are directly related to accountability issues such as financial record keeping and profitability so necessary for accessing appropriate capital. The current modus operandi of the company is not sustainable if limited strictly to the local market. While it is recognized for good work, in terms of quality and on-time completion, the company lacks the organizational project management procedures and practices, which if implemented, would improve project development and project goal attainment.

The general objective for this project was to develop a Project Management Office proposal (PMO) for PCSL in order to maximize its profit generation potential from the projects it undertakes. The specific objectives were; to assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs; to analyze the different PMO types in order to recommend the most suitable one for PCSL; To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency; to determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure, and last but not least, to propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure and improve its performance.

The methodologies employed in this research were based on literature reviews of similar researches using the analytical, deductive and observational methods. The analytical and deductive methods allowed for an in-depth analysis of the company structure, while the observational method was used to evaluate and record the deliverables and their acceptance by stakeholders. The tools used in this research were based on a six sigma questionnaire sample. The results of the analytical method propelled the analysis of the different types of PMOs in order to determine the best suitable for PCSL's development.

The maturity assessment results concluded that PCSL has strengths as well as weaknesses in certain project management areas, such as leadership approach to lean, approach to errors and partial training for employees. Upon the analysis of the three basic types of PMO's, it was concluded that a Hybrid of supporting and controlling PMO was most suitable at this time. It was further concluded that establishing project methodologies, Project tracking and Project Support, constitute the main roles and responsibilities identified for the proposed PMO for PCSL.

Conclusion to the main objective of this is research was that, a PMO was necessary and indeed should be developed to maximize PCSL profit generating potential on projects.

Pursuant to the results of this research, it was recommended that:

A maturity assessment should be conducted at least every two years to update the status of PCSL, and a routine review program should be established preferably every six months to analyze the relevance of the PMO, and so advise key stakeholders if and when PCSL would be better served with another PMO type. A review panel should be built into the company's management and staff structure, and be tasked with reviewing the existing role of the PMO and determining its adequacy or lack thereof.

A systematic implementation plan of the PMO is recommended to be introduced early enough to all stakeholders through various consultations, and group meetings. This would allow consensus to agree on a smooth transition to the successful implementation of the PMO

1. INTRODUCTION

1.1 Background

Prudy's Construction Services Limited (PCSL) is a medium size construction company registered under the laws of St. Lucia. Before the year 2013, the company operated as a sole proprietorship under the name of Prudence Montrope.

Mr. Montrope has been in construction for over 25 years, however until recently, he operated as a sub-contractor with a small crew of no more than 10 workers, under the banner of NH International Caribbean Limited.

In 2013, Prudence was awarded a contract by a private investor who had just settled on the island and was building his home. Upon the successful completion of that project, the client promised him a bigger job: to build a dive shop, as the first phase of a major hotel development project. Considering the magnitude of such a project, Mr. Montrope was advised to register the company as a fully-fledged construction company.

In 2013, Prudence Montrope registered what is now known as PCSL. His experience mirrors that of many small construction companies in Saint Lucia. These companies typically start as a "one man show" and then evolve into a small crew, until they are forced to evolve to respond to situational circumstances such as a sudden change of scale in operations.

It is also observed that small construction businesses incorporate in order to respond to larger financial opportunities. This involves larger revenue and cost profiles, and new tax obligations. As such, external rather than internal factors often create the impetus to formalize corporate structures.

In Saint Lucia and most of the Caribbean, the absence of a customized Project Management Office (PMO) within smaller construction companies like PCSL causes them to operate on an ad-hoc basis from project to project.

In such cases, few if any performance indicators are used, and projects show very unpredictable outcomes. Unplanned changes in scope, time, cost and human resources often result in low or negative returns on investment.

The new paradigm shift in global competitiveness and service procurement, as well as greater demands by major stakeholders for high return on investments, has imposed unprecedented challenges in the field of construction. These demands fall disproportionately on companies in small markets. These companies often lack the critical mass to develop and sustain the required institutional infrastructure.

Such small companies therefore struggle to meet the minimum requirements for procurements for any meaningful Project.

1.2 Statement of the Problem

The problem the industry faces is that, many construction companies like PCSL are unable to survive sustainably. They encounter structural difficulties in both local and regional markets and cannot graduate into the highly competitive global market.

This is due in part to their non-exposure to current project management procedures and practices, which could engender better systems for project development and project goal attainment.

Both financial and managerial deficiencies implicit in their spontaneous or unplanned expansion, leave such entities unable to effectively cope with the ever-increasing demands from shareholders and investors.

The imminent problem is the non-existence of Project Management Practices and skills, which are directly related to accountability issues like financial record keeping. This includes profitability that is so necessary for accessing appropriate capital.

This in turn, prevents such companies from competing effectively on both private and public tenders. Despite substantial experience and expertise they may easily become marginalized by companies with better administrative and managerial systems. Hence, they are unable to realize the full financial benefits available from the domestic and regional industry.

In an effort to survive, some small companies have tried in an ad hoc manner, to imitate the organizational profiles of their larger competitors. However, without a systemic change and the throughput to sustain it, this causes them to lose more money in overheads and carrying costs that cannot be sustained. Eventually, they collapse and disappear.

PCSL is a typical example of such problems. To be able to grow, it will require the systematic creation and inclusion of a PMO, to catalyze its transition to a properly functional construction company.

1.3 Purpose

The purpose of this research is to analyze the current organizational structure and project management maturity of PCSL in light of all the problems stated above. The intention is to develop a PMO proposal that is suitable for PCSL transition.

The overall intended benefit of this process, despite which type of PMO is developed, is to maximize the profit generation capabilities of PCSL. The lesson can then be shared with other companies of similar size and structure as PCSL.

This would afford them a leveled platform to be able to compete for bigger Public and Private sector projects, and most importantly, to realize profits from these projects and increase their return on investment (ROI).

1.4 General objective

- To develop a Project Management Office proposal (PMO) for PCSL in order to maximize its profit generation potential from the projects it undertakes.

1.5 Specific objectives

- To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs.
- To analyze the different PMO types in order to recommend the most suitable one for PCSL.
- To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.
- To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure.
- To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure its performance and improve it.

2. THEORETICAL FRAMEWORK

2.1 Company/Enterprise Framework

This research is conducted in Saint Lucia using Prudy's Construction Services Limited (PCSL) as a pilot case study.

PCSL is a medium sized construction company registered as such under the Companies Registration Act of Saint Lucia.

2.2 Company Background

The main commercial activity undertaken by PCSL is building works. Prior to being registered as PCSL, it worked as a subcontractor under NH International Caribbean Limited.

Its portfolio of works ranges from multi-story car parks to commercial buildings and residences. However, in 2013, it added to its portfolio a 7-storey hotel project due to be completed by the end of this 2017.

2.2.1 Mission and Vision Statements

Mission:

To determine through research, those tools and techniques that would help small and medium sized companies realize both their financial and corporate social responsibility potentials.

Vision:

An equitable and competitive environment, which allows for the growth and development of small, medium and large construction companies, according to their respective potentials.

2.2.2 Organizational Structure

Currently, PCSL has a structure like most small companies in St. Lucia. There is the owner, who also normally is the General Manager, and then

the rest are staff at varying levels of competence and qualification. As indicated in figure 1, PCSL is structured where the Project manager, has overall responsibility for running the operations of the company, assisted by auxiliary staff.

PRUDY'S CONSTRUCTION SERVICES LTD. ORGANIZATIONAL CHART

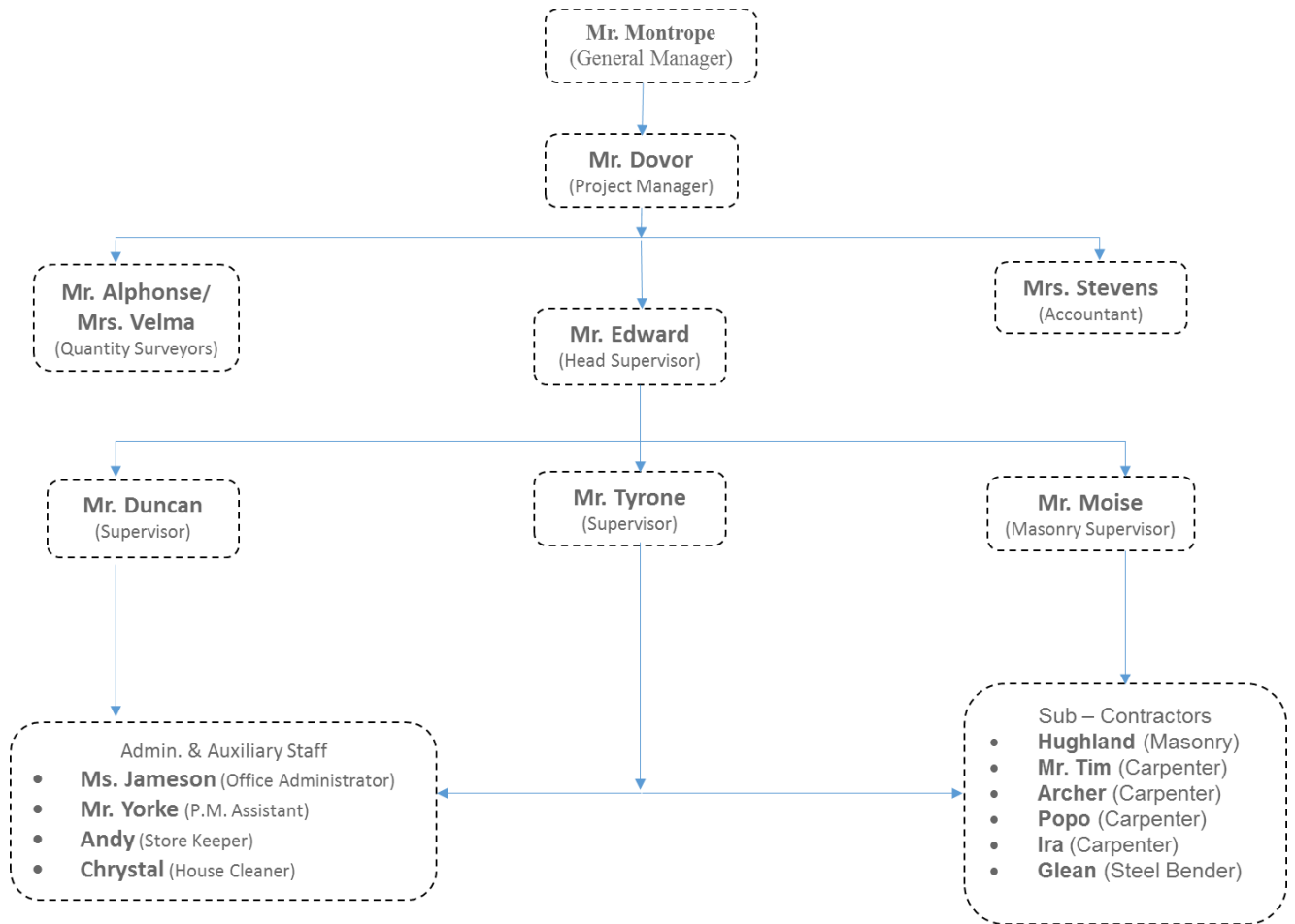


Figure 1 Organizational structure

Source: PCSL Archives, 2016)

2.2.3 Products Offered

PCSL offers a wide range of construction services, including civil Works, renovations and new construction services. The key objective of this research is to determine the maturity levels of PCSL via project Management tools and techniques. These same project management skills, tools and techniques will foster better management and operational systems in order to maximize its financial and operational viability.

2.3 Project Management concepts

Project management is the practice of utilizing people, tools, skills and techniques in a coordinated manner to achieve a deliverable end, be it a product, service or change in a predicted output. There are myriad of processes that make up project management. The detailed knowledge of these processes constitute the basic skill set to becoming a project manager.

Relevant concepts as may be applicable to this research are outlined below:

2.3.1 Project

A project is a temporary undertaking to create a definitive product, service or result. It must have a start and end date. (PMBOK, fifth Edition, p.3). For the purposes of this research, a project shall be a proposal of a Project Management Office (PMO) for PCSL.

2.3.2 Project Management

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. (PMBOK, fifth Edition, p.5)

2.3.3 Project Life Cycle

A project life cycle is the series of phases that a project passes through from its initiation to its closure (PMBOK, fifth Edition, p.38). The generic life cycle of most projects are:

- Starting the project,
- Organizing and preparing
- Carrying out the project work
- Monitoring & Control
- Closing the project.

TYPICAL PROJECT LIFE CYCLE

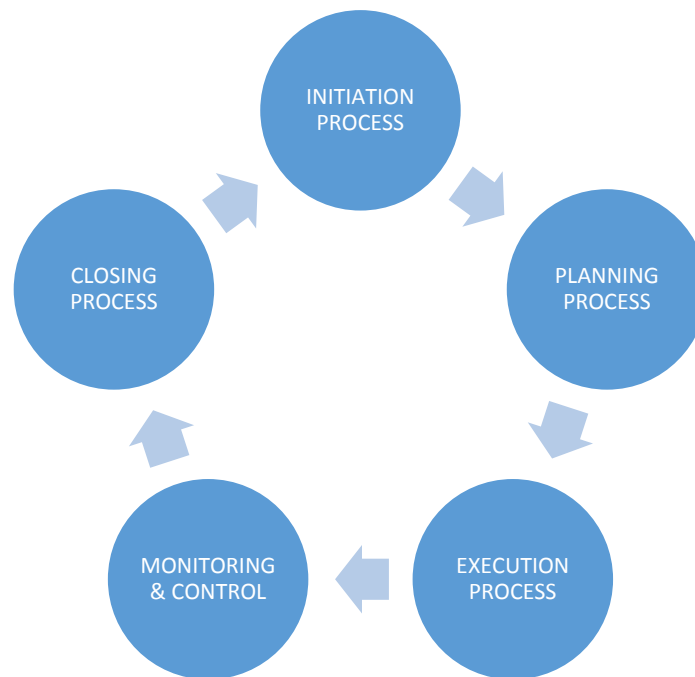


Figure 2 Typical Project Life Cycle

(Source: Author, 2017)

PCSL does not have a defined project cycle. One of the intents of this research is to enable via the proposed PMO, procedures such as structured project cycles that would assist PCSL in managing its projects from staffing

to start the project, managing and executing right down to closing the project.

2.3.4 Project Management Processes

Project management constitutes the core process that links the various parts of a project's activities and processes. There are 47 processes that are divided into ten (10) knowledge areas. These knowledge areas interact with the Five (5) main process groups called the **Project management process groups**. These are Initiation, Planning, Execution, Monitoring & Control, and Closing. Every project must go through different stages of these process groups. These processes are applicable to all projects and are highly interactive.

Each knowledge area is characterized by its inputs, the tools and techniques that can be applied and their resulting outputs. (PMBOK, fifth Edition, p.47). For this research project, with the exception of Project procurement management, this final graduation project (FGP) followed the same knowledge areas from the formulation of the Project Charter to the actual project which in this case was to propose a Project Management Office (PMO).

2.3.5 Project Management Knowledge Areas

A knowledge area is a complete set of concepts, terms and activities that make up a professional field or area of specialization. The attempt to propose a PMO will require the application of some of the project management knowledge areas to assist in the evaluation the maturity of PCSL.

The knowledge areas as established in PMBOK guide, fifth edition, and applicable to the setting up of this research work are:

Project Integration management: This knowledge area characterizes the initial steps of a project development. It embodies the integration of all project management processes and their interdependencies. Project integration management allows for the development of the Project Charter, Project Management Plan, project work development, and project monitoring and control plan which manages how to perform change control and close the project. All these constitute the series of first applications of the knowledge areas to project management.

Project Scope Management: This is the knowledge area responsible for defining the processes required to ensure that the project includes all the work required to successfully complete the project. In this case, it was the development of the FGP.

Project Time Management: This includes all the processes which ensure that a project is completed timely. This was defined by UCI, with the assumption that the FGP should be completed by March, 2017

Project Cost Management: Includes the processes for all cost related aspects of a project. It normally allows for the development of processes such as Plan Cost management, cost estimation, determining project budget and project cost control.

Project Quality Management: This is the knowledge area which includes processes and activities that determining the quality objectives and responsibilities of the project. The intent is to guarantee the satisfactory delivery of product or products for which it produces. It uses processes like Quality management plan, and Quality assurance and control quality to ascertain its deliverables. Tutors and readers of this research constitute the custodian to the quality management component of the FGP.

Project Human Resource Management: This includes processes that organize and manage the project team. It allows for the development of a Human resource plan for the project.

Project Communication Management: Includes the processes that ensure the timely collection, control, planning, retrieval, distribution, storage and management of the project information.

Project Risk Management: This allows for conducting Plan Risk Management, Risk identification plan, Qualitative and quantitative risk analysis as well as the risk response plan with the view to increase the likelihood of a positive impact and decrease the likelihood of a negative impact or occurrence on a project.

Project Procurement Management: Includes the processes necessary for ensuring the purchase or acquisition of required products. This is the only exception that this FGP had not fully instituted.

Project Stakeholder Management. This includes the processes necessary to identify the person or persons, groups, and organizations that may impact or may be impacted by the outcome of a project. It also focuses on keeping the flow of communication to and from the stakeholders with a view of understanding their needs and expectations. These it does through processes such as Stakeholder identification, plan stakeholder management and control stakeholder management. In the case of this research, key stakeholders were the client, management and staff, of PCSL, and other stakeholders as employees and suppliers,

2.4 Project Management office (PMO), Project Management Maturity.

PMO (Project management Office)

A project Management Office (PMO) is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. The responsibility of a PMO can range from providing project management support to directly managing one or more projects. (PMBOK, fifth Edition, p.10). The three (3) main types of PMO structures are, Supportive, Controlling and Directive. A supportive PMO structure performs primarily a consultative role to projects by supplying templates, best practices, training and serves as a repository of information from lessons learnt from previous projects. A Controlling PMO structure provides support to projects by requiring compliance through project management framework or methodologies and using specific templates, tools and forms or conformance to governance to achieve its mandate. A directive PMO structure is one that takes full control and directly manages the project or projects. This PMO structure has the highest control of all the three (3) PMO structures.

Chart 1 Types of PMO

<ul style="list-style-type: none"> • Supportive- Consultative, coaching role- Where the role is to provide best practices, tools ,templates and training and access to knowledge bases on previous projects
<ul style="list-style-type: none"> • Controlling- Supportive Role- Provides all the tools and templates but also ensures compliance through audits
<ul style="list-style-type: none"> • Directive – Provides tools and templates, best practices etc. It also ensures compliance through audits and directs completion of projects

(Source: Author)

2.5 Project Management Maturity

Project management maturity is explained as a progressive and holistic model that develops an organization's approach, methodology, strategy, and decision-making process as defined by the three core areas of project management: people, process, and tools. Maturity model can help your organization identify gaps, and take important operational steps, toward improving its entire culture around project management. Mature organizational systems and processes assist the achievement of consistent project management excellence. The understanding of maturity, however, is often a subjective concept (Pretorius et al., 2012).

There are numerous maturity models around particularly within the Information Technology (IT) and Business Management sectors. It should be noted though that, maturity models, just like the discipline of project management apply generically to any industry sector.

Some of the main maturity models identified during the literature review for this FGP and are briefly mentioned and explained are:

- Capability Maturity Model Integration (CMMI)
- Portfolio, Program & Project Management Model (P3M3)
- Organizational Project Management Maturity Model (OPM3)
- Lean Six sigma Maturity Model

2.5.1 Capability Maturity Model Integration (CMMI)

The Capability Maturity Model Integration (CMMI) was a project developed from a number of other tools put together in the late 80s to mid-90s to form a single integrated tool (de Souza and Gomes, 2015). It was spearheaded by the CMMI Institute.

The CMMI Institute operates through a network of CMMI partners, which comprise trained and certified organizations and individuals providing

official training programs, appraisals and other consulting services. It provides a set of practices or improving processes, resulting in a continuous improvement system that paves the way for better operations and performance.

CMMI was used heavily by organizations that undertook software development, systems engineering and product development. It uses a single tool to assess maturity or capability,

There are five (5) maturity levels used in the assessment of CMMI:

1. **Initial:** Processes are unpredictable, poorly controlled and reactive
2. **Managed:** Processes are characterized for projects and are often reactive
3. **Defined:** Processes are characterized for the organization and are proactive
4. **Quantitatively managed:** Processes are measured and controlled
5. **Optimizing:** There is a focus on process improvement

Some analyst have stated that there is a problem with the adoption of CMMI by organizations. An assessment facilitation of is required to avoid wasting resources (Allué et al., 2013).

The challenges of CMMI are that, few tools support all of the types of CMMI-related activities. The support level is often limited, and the ability to customize tools to suit the users, is quite small (Musat et al., 2010).

2.5.2 Portfolio, Program & Project Management Maturity Model (P3M3)

P3M3 is a model developed to assess government maturity standards. According to (Sowden et al., 2008), P3M3 also acts as a roadmap for ongoing improvement and progression towards realistic and achievable goals that are suitable for business needs and aspirations. P3M3 focuses

on helping to expand emerging processes of project complexity that contribute to overall success.

The levels of maturity assessment in P3M3 are effectively identical to those for CMMI. P3M3 has a strong support base in the United Kingdom. It is developed based on seven project process-related perspectives. These perspectives are:

1. Organizational governance
2. Management control
3. Benefits management
4. Risk management
5. Stakeholder management
6. Finance management
7. Resource management

(Young et al., 2014) argue that one deficiency of the P3M3 model is that it uses a single number to represent maturity at the project, program and portfolio level. The concern is that the single number reported is therefore misleading and will generally report a lower level of maturity than what is present in an organization. It also may paint a poorer picture than what might exist and disregard the relative closeness of the next higher level.

Another shortcoming they mention is that the 'generic attributes' evaluated in all three P3M3 domains are claimed as essential to achieving improvement in project management maturity. It is doubtful however whether these generic attributes are appropriate for program and portfolio management domains, which are typically more complex than standalone project management (Young et al., 2014)

2.5.3 Organizational Project Management Maturity Model (OPM3)

OPM3 is a maturity model developed between 1998 and 2013, by a team of volunteers from the PMI. The model is believed to be suitable for organizations of any size, location or practice environment. (Langston and Ghanbaripour, 2016)

OPM3 is aligned specifically with PMBOK methodology. Its aim is to measure the level of maturity of projects and practices, based on best practices as its methodology for assessment. OPM3 compares organizational activities with a large number of standardized best practices, measuring them in project, program and portfolio management contexts by examining capabilities and related outcomes. (Langston and Ghanbaripour, 2016)

OPM3 maturity is classified into four levels. (Pinto and Williams, 2013): The levels are:

1. Standardize: Structured processes are adopted
2. Measure: Data is used to evaluate process performance
3. Control: Control plan developed for measures
4. Continuously improve: Processes are optimized

OPM3 is by far the most sophisticated of the identified maturity models in the discipline of project management. It is also the most resource intensive (Backlund et al., 2014). OPM3 is based on series of project management best practice standards collated by certified assessors. The current unrest between certified assessor and the PMI over the current directions of a product and subsequent shared intellectual property rights, make access to the use of the tool difficult. OPM3 is currently under review.

2.5.4 Six sigma & Lean Six Sigma

Six sigma is described as a strict data driven methodology that has a set of techniques and tools for process improvement. It seeks to improve the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes. (QP, 2017)

Lean six sigma

Lean six sigma is a fact-based data driven philosophy of quality improvement that values defect detection. It drives customer satisfaction and bottom line results by reducing variation, waste, and cycle time. It promotes the use of work standardization and flow, thereby creating a competitive advantage. It is applicable anywhere variations and waste exist.

The distinction between six sigma and Lean is blurred because process improvements requires aspects of both. They overlap in many aspects, although they do present some functional differences. Lean focuses on waste reduction whilst six sigma focuses on variation reduction. Lean uses less technical tools such as workplace organization and visual controls, whilst six sigma uses statistical data analysis and design of experiments. (ASQ, org)

Lean six sigma maturity assessment model is based on a detailed step by step quantitative scoring of pre-established parameters. This is to diagnose the current state of an organization or company. The Six sigma methodology is aimed at leading an organization towards a future state of improving its internal processes, satisfy its customers/clients, and allow its leaders to know the current state of their business. Also this can be used to identify the strengths and weakness of the organization. The same can

engender, improve opportunities, and the balance sheet, and return on investment (ROI).

Lean six sigma maturity model is categorized in five levels. The five levels are:

1. **Initial:** Processes are unpredictable, poorly controlled and reactive
2. **Managed:** Processes are characterized for projects and are often reactive
3. **Defined:** Processes are characterized for the organization and are proactive
4. **Quantitatively managed:** Processes are measured and controlled
5. **Optimizing:** There is a focus on process improvement

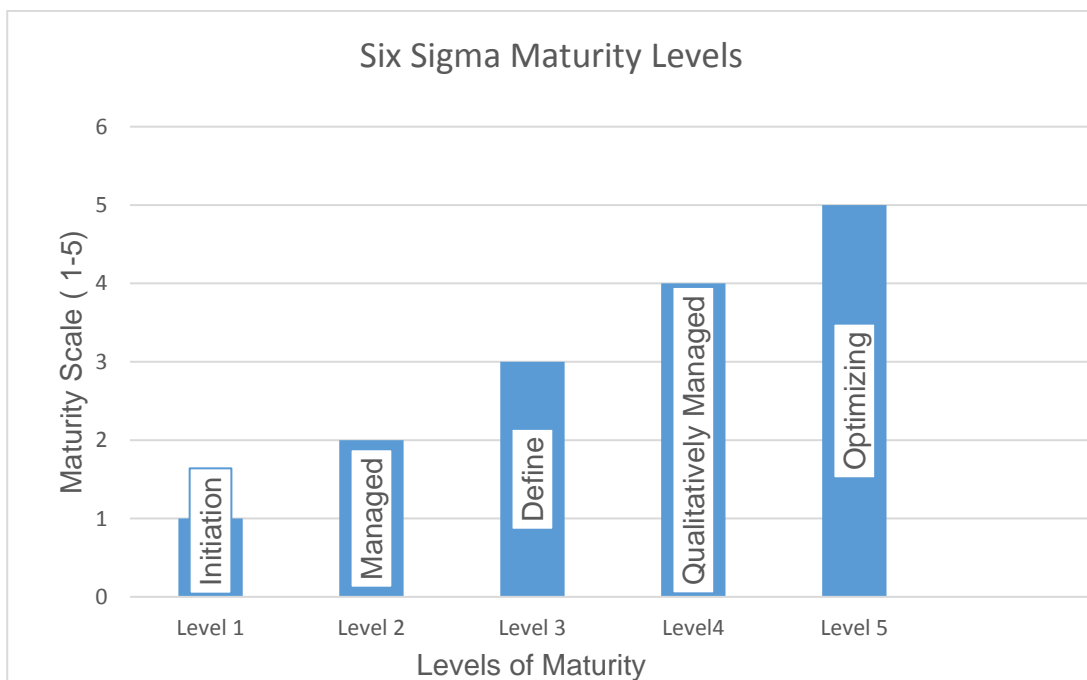


Figure 3 Six Sigma Maturity Levels

(Source: Author)

One of the objectives of this FGP is to conduct a maturity assessment on PCSL. In lieu of that, various maturity models were reviewed and their

characteristics examined. Maturity models generally all geared toward evaluating the status quo of the organization with a view of highlighting, strengths and weaknesses in the organization. It also serves to direct executives into the directions that require immediate attention in order to attain or keep attaining measurable success in their organization.

However, the analysis showed some of the inflexible characteristics and draw backs of some of the main maturity models reviewed. For the purposes of this FGP and its immediate application in the field of construction, a maturity model that presents the following characteristic is sort. The maturity model should be:

- Directed at assessing the current methods and processes of an organization or company.
- Its procedure and processes should not only be rated against a “one size fit all” best practices, but also company specific best practices.
- Fit for any size company or sector and applicable to starter companies as well as existing and matured organizations or companies.
- Not too resource and financially demanding.
- User-friendly and non-complex in structure and execution
- Can be compared to a standardized industry benchmarks or company specific generated benchmark.
- Level rating should be aspects specific and not only single index level rating.
- Measure non tangible aspects of organizations, such as employees “feel good”, loyalty, trust and creativity.
- A model that is evidence based, adaptable to a Plan, Do, Check, Act (PDCA) methodology and provides for continuous improvement frameworks

2.6 Maturity assessment model for this FGP

This research proposes to use an already established Lean six-sigma methodology of maturity assessment that is based on a detailed step by step quantitative scoring of pre-established parameters. Lean six sigma is chosen for this research because it embodies if not all, most of the characteristics described as fit for purpose for this FGP. The Six sigma methodology is aimed at leading an organization towards a future state of improving its internal processes, satisfy its customers /clients, and allow its leaders to know the current state of their business. Also this can be used to identify the strengths and weakness of the organization. The same can engender, improvement opportunities, and the balance sheet, return on investment (ROI).

The six sigma model applied herein comprised a series of questionnaires set to evaluate twelve categories that would normally cover an organization's structure. Six sigma methodology of maturity assessment recommends the use of a three (3) phase approach normally referred to as the 3A Approach (Analyze, Assess, and Address).

The 3A approach consist of using a scorecard with a twelve (12) six sigma pre-established parameters. These are, leadership alignment, leadership approach towards six sigma, employee involvement, training, process capability, approach to errors, data driven problem solving, continuous improvement methodologies, standard work, value stream mapping, accounting support to lean six sigma and housekeeping. These parameters while originally set for quality management for the industrial sector, have been used to evaluate maturity levels in the construction sector, hence its use for this FGP.

Six sigma rating scale is from one (1) - five (5). This standard scale is used to assess the individual parameters where one (1) represents the lowest maturity and five (5) represents the optimum in a particular category. An average score for each parametre in the questionnaire is recorded, and then measured against

a benchmark in that category. The tally of all the averages of each parameter is further used to measure against six sigma maturity level rating, which is also from one (1) – five (5). One (1) signifies lowest maturity level while five (5) is optimum maturity level.

The maturity level assessment benchmark for the construction sector was first documented in the early 90's at 3.26 on a 5- point scale. (Ibbs & Kwak, 2000). The benchmark is a statistical median index based on many earlier maturity assessment research for companies across sectors. More recent maturity assessment researches conducted across regions and varying sizes of construction companies' revealed that, there has not been significant change from the 90's. Although with the implementation of project management, companies are attaining better results on their projects and making better financial impacts, the benchmark has just slightly shifted to 3.36 on a 5-point scale. (Langston, C. and Ghanbaripour, A.N. 2016) Benchmarking is very important in that it allows a company to evaluate its project management delivery capabilities just as much as to determine the financial impacts of project management in an organization against its peers or a set measurable standard. In certain cases, benchmarks or baselines are established not necessarily from scientific data gathering, but rather from empirical analysis. The analysis could be based on what exist with the company or organization in its current state, and what stakeholder's expectations are for improvement into the future. Once the determined maturity assessment index result is ready, it is compared with the benchmark index. Lean six sigma determines that the difference between the benchmarked value and maturity level index is called the "maturity gap". The same is applied to this research.

The six sigma maturity assessment model, used interviews and surveys with team members, and other stakeholders to establish the data from which the results and conclusions are reached.

One of the fastest proven ways based on other maturity assessment findings is the use of the questionnaire and or in conjunction with a technique called *brain writing* (*six sigma, Tools and techniques, 2014*). This has been proven to yield faster results, diverse solutions yet not compromising the value of the outcome Vis a Vis other techniques such as the traditional brain storming technique. The application of the brain writing techniques is preferred and applied here based on the assumption and constraints set forth in this research.

Due to both time and resource constraints, the research used the twelve (12) six sigma established categories and formulated twelve (12) corresponding questionnaires. Six (6) randomly selected team members, made up of workers and supervisors and six (6) senior management and key stakeholders were selected as the respondents. In total, there were 144 responses to the twelve (12) questions.

3. METHODOLOGICAL FRAMEWORK

3.1 Information sources

For the purposes of this research, Information sources can be defined as a location, portal, site, or institution, from where somebody is able to gather knowledge or information for their use or consumption.

The information source for this project stretches from literature reviews, PMBOK, to the World Wide Web, to documentaries, personal experiences, academic journals and PCSL archives.

3.1.1 Primary source

Primary source of information for this research shall be defined as: *a first hand and or direct source from where the original information is obtained.*

Interviews with the managing Director of PCSL and other key stakeholders, personal experiences documented from Site related activities.

3.1.2 Secondary sources

Secondary source of information is the source that is not the primary source. For example, The PMBOK, fifth edition, 2013, PCSL archives, The World Wide Web, journals, documentaries, presentations on project management and PMO's, all constitute secondary sources of information.

Chart 2 Information Sources

Objectives	Information sources	
	Primary	Secondary
To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs.	PCSL organizational structure and operational processes and procedures	Project management tools and techniques from PMO experienced practitioners and experts. Online literature and academic journals review.
To analyze the different PMO types in order to recommend the most suitable one for PCSL.	Interview with the managing Director of PCSL, key stakeholders & Project Team	Website research on PMO's, Project Management sources, templates and documentaries.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency	The Project manager	Journals, and Project Management websites PM books, PMBOK, articles and presentations from Project Management offices.

Objectives	Information sources	
	Primary	Secondary
To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure.	The Project manager	Journals, and Project Management websites, PM articles and presentations from Project Management offices.
To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to be able to measure its performance and improve it.		PM books, PMBOK, articles and presentations from Project Management offices. Journals, and Project Management websites

(Source: the author)

3.2 Research methods

The Cambridge Dictionary (Dictionary.cambridge.org) defines research methods as “a particular way of studying something in order to discover new information about it or understand it better”: On this project, the research methods used were primarily Literature reviews, Analytical, Deductive - Inductive and Observation research methods.

3.2.1 Analytical method

This method consists of using critical thinking skills combined with the accurate evaluation of facts and information gathered for the research that is being conducted, in an effort to break down a problem or situation under research into manageable components for solving. (What is Analytical Research? (n.d). Retrieved November 18, 2016

3.2.2 Deductive –Inductive method

This is a common method of research in which the deductive method is geared at testing an existing theory, thus arriving at a logical conclusion, while the Inductive method is aimed at generating a new theory or theories based on the gathered information or data at hand. (Gabriel, D. D., 2013).

3.2.3 Observational method

This form of research is non-experimental, in that the research is carried out through the mere observation and acknowledgement of the ongoing pattern. (Crossley, M. W., & Preston, R. 1987).

Chart 3 Research methods

Objectives	Research methods		
	Analytical Method	Deductive-Inductive Method	Observational Method
To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs	This method was used to assess the current maturity status of PCSL. Six sigma standards were used as references and baseline standards	This method is applied by testing the tools and techniques used to assess the maturity status of the organization.	
To analyze the different PMO types in order to recommend the most suitable one for PCSL.	The analytical method in this instance was used to study and understand the general roles and responsibilities of a PMO in an organization.	This method was used to compare the characteristics of the different PMO's, to then determine correctly the suitable one for PCSL.	

Objectives	Research methods		
	Analytical Method	Deductive-Inductive Method	Observational Method
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency	This method made for the critical thinking of the roles and responsibilities to be assigned to the PMO for the first time in the history of the company.	This method was used to gain an understanding of the roles and responsibilities of the various PMO's, and then systematically categorize these responsibilities as may be applicable to PCSL's PMO at this time.	
To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in	The analytical method helped with the literature reviews of similar management structures in order to prioritize		

Objectives	Research methods		
	Analytical Method	Deductive-Inductive Method	Observational Method
order to prioritize its functions on the management structure.	the functions of the proposed PMO.		
To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure and improve its performance.	This method served as the critical thinking and analytical guide to developing the implementation plan for the PMO.	This method brought in the component of facts gathering and the effective use of the data that was collected from the research. The data was then used to create a new outcome.	This method helped record the questionnaire response patterns of stakeholders. It also helped summarize to which PMO stakeholders were more aligned with. Furthermore it helped with gathering consensus on how improvement on new projects should be measured.

(Source the author)

3.3 Tools

Research tools are defined as any instrument, resource or information medium that can be used to facilitate, enhance the accomplishment of a task or operation.

The tools used in this final graduation project are meetings, expert judgment, scheduling tools, alternative analysis, analytical techniques, and Lean six sigma maturity model

Chart 4 Tools

Objectives	Tools
To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs.	Lean six sigma maturity assessment model
To analyze the different PMO types in order to recommend the most suitable one for PCSL.	Meetings, Expert judgment.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency	Meetings, Expert judgment. Stakeholders consultation, Online PMO templates
To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure.	Meetings, Expert judgment. Key Stakeholders consultation
To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure and improve its performance.	Stakeholders input and Online PMO research templates and experts advice.

(Source the author)

3.4 Assumptions and constraints

An **Assumption** is, according to PMBoK (PMBOK, 2013, Fifth edition, pg. 124): *“An actor in the planning process that is considered to be true, real, or certain, without proof or demonstration”* and **Constraint** as *“A limiting factor that affects the execution of a project or process”*.

The assumptions of this final graduation project are:

- PSCL current operations need a PMO
- A PMO on the hierarchy of PCSL organizational structure will help it be more effective with its projects.
- Due to PCSL size, a non-complex PMO would be more appropriate.
- Developing a methodology to plan PCSL work schedule would lead to better return on investment (ROI).

The Constraints of this project were:

- Finding the right Maturity assessment Model for this FGP.
- Management sensitivity or lack thereof for the value of PMO on PCSL organizational structure.
- Scope and time

The scope of this project was to develop a project management office proposal for PCSL. The proposal required determining the maturity level of the company. The project scope started with proposing a PMO through to implementing a PMO plan and determining the required sequence of implementation. The time requirement for this project was short three (3) months, thus making it one of the main constraints of the project. A lot more supporting areas for this research could have been covered if time allowed it.

There was also another constraint, which was the cost of preparing this research. There were direct and indirect costs associated with gathering

the information, and then processing it to extract what is relevant to apply to this research.

Chart 5 Assumptions and constraints

Objectives	Assumptions	Constraints
To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs.	PSCL currently needs a PMO	Finding the right Maturity assessment model for this FGP
To analyze the different PMO types in order to recommend the most suitable one for PCSL.	A PMO on the hierarchy of PCSL organizational structure will help it be more effective with its projects.	Management sensitivity or lack thereof for the value of PMO on PCSL organizational structure.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.	Due to PCSL size, a non-complex PMO would be more appropriate.	Scope and time.
To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure.	That the PMO should be effective relatively quickly to help persuade all stakeholder of its vitality on the Organizational management of PCSL.	Management sensitivity or lack thereof for the value of PMO on PCSL organizational structure.

Objectives	Assumptions	Constraints
To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure and improve its performance.	Developing a methodology to plan PCSL work schedule that would lead to better return on investment (ROI).	Scope and time

(Source the author)

3.5 Deliverable(s)

A deliverable is defined in the small business.chron webpage as, “a *tangible or intangible product or service produced as a result of a project that is intended to be delivered to a customer (either internal or external) in order to finish a Project*”.

The deliverables of this project are:

- A report of the level of maturity of PCSL
- Report detailing the roles and responsibilities assigned to the suitable PMO for PCSL.
- Report detailing the suitable PMO implementation plan for PCSL
- Report of the appropriate methodology, tools and templates.

Chart 6 Deliverables

Objectives	Deliverables
To assess the maturity level of PCSL, in order to determine its project management strengths and ability to respond to improved opportunities and expanding needs.	A report of the level of maturity of PCSL
To analyze the different PMO types in order to recommend the most suitable one for PCSL.	Report detailing the roles and responsibilities assigned to the suitable PMO for PCSL.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency	Report detailing the suitable PMO implementation plan for PCSL
To determine the appropriate location of the proposed PMO within the existing management structure of PCSL, in order to prioritize its functions on the management structure.	A report of the location of the PMO on PCSL's organizational management structure
To propose a PMO implementation plan for PCSL including the sequence of main steps required to achieve it, in order to measure and improve its performance.	Report of the appropriate methodology, tools and templates.

(Source the author)

4. RESULTS

For the purposes of this research, a questionnaire was set out using Six Sigma methodology guidelines to identify the areas to be assessed for the determination of a maturity level for PCSL. There were twelve (12) questions of which, each question was rated on a scale of one (1) – five (5) with one (1) being the least favourable and five (5) being the optimum option to attain the highest maturity level.

A random selection of twelve (12) workers including all senior management were the respondents to the questionnaire. However, there were three (3) meetings and consultations with workers to get feedback based on the intent of this research. There was an average of 48 workers in each session of meetings and consultation. Based on the responses received from the questionnaire and the review and analysis of the responses, the following maturity assessment results were obtained:

In the category of “Leadership alignment”, the results of the maturity assessment indicated that leadership is somewhat aligned with the process improvements but, visible and active selection and review of projects were not in place. No trained and committed resources are available to support projects. (See results in appendix 2)

In the category of “Leadership towards Lean six sigma”, it was also recorded that the company Executive demonstrated an understanding of the Lean six sigma approach to project management. However, nobody was sure how it could be applied to PCSL.

The results from the “Employee involvement category “showed that there was a split in responses where 25% of the respondents agreed that there was an involvement of people in the process improvement to some extent. And that people were eager to work in teams. Whilst another 25% agreed that it is only when a problem arises, that people from cross functional teams work together to solve problems.

The results from the category of “Training and Education” indicated that just a few team members may have heard of the concept of improvement methodology, however some team members are trained in basic 5S concepts.

In the category of “approach to errors”, the results of the assessment showed that although errors do occur, some initial thought prevails to mitigate or implement a project free from error system.

The results from the analysis of the category of “methodology of continuous improvement” indicate that PCSL is an improvement reactive company with actions only taken usually when management or supervisor demands it. There is no set system in place to monitor and guarantee continuous improvement.

In the area of “value stream mapping”, the survey shows that most respondents believe that PCSL does not use value stream mapping to plan its projects. They recommend 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 PCSL, only records the basic financial data based on cost accounting. There is little awareness of the greater impact of the role of accounting in support of a six sigma approach or initiative.

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

In order for a PMO to be selected as per the second FGP objective, an analysis of the types of PMO is required. There are three (3) basic PMO types as previously cited. Each PMO type is analyzed subsequently. The PMOs are; Supporting, Controlling and Directive type of PMO’s. The criteria employed here to choose a PMO for PCSL was based on two (2) main defining aspects of a PMO. The two (2)

aspects are, first the PMO responsibility as a governance and standardization resource body. Secondly the range of PMO authority or control it possesses

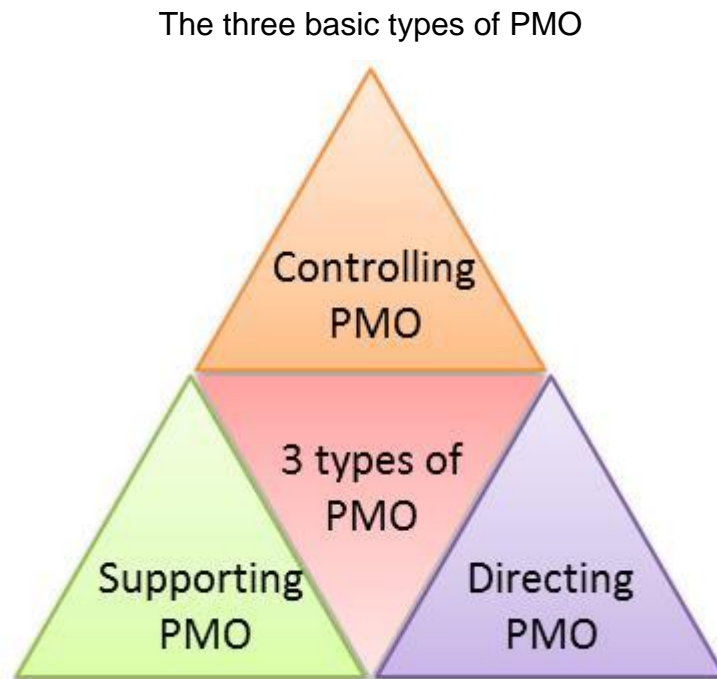


Figure 4 Three Types of Project management Office (PMO)

(Source: PMI - Google images)

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 seven (7) key stakeholders. The seven (7) comprised of four (4) senior management and three (3) senior team members- supervisors. Each person was asked to put in a box, which responsibilities and level of authority they wanted the PCSL PMO to have. The result of this exercise indicated that most stakeholders preferred to have a PMO with supporting characteristics, yet also have the benefits of project and processes governance. In other words, a hybrid of PMO's.

A greater awareness and impact of the role of the PMO in support of six sigma initiative would require that the roles and responsibilities of the chosen PMO be established. Once the PMOs roles and responsibilities are establish, then it will give

it the autonomy to foster the much required awareness through the entire organization.

Similarly, it is important to note that the results from this questionnaire also indicated that for a possible improvement in the management structure to occur as been sought for PCSL, it has to happen sooner rather than later. This is because leadership is of the view that the time for adjustment and improvement for the overall development goals is now. Furthermore, there are apparent project opportunities in the near future with foreign companies. Such anticipated alliance would require that PCSL is compliant with standard organizational processes and procedures. Hence PCSL is expected to act promptly to address its short falls in project attainment and all project management processes and procedures it needs.

However, it is not sufficient to merely identify the roles and responsibilities of the PMO, but rather, implement the systems and processes identified in the research as recommended. This leads to the last objective of determining an implementation plan for PCSL's PMO.

Finally, the results of this research using the questionnaire, proved to be fruitful as it helped determine the need for a structured project management process that should help re-orient the efforts of PCSL into maximizing its potential and optimizing its returns on investments via the guidance and support of its PMO

4.1 Assessment of the Maturity of PCSL

It is common knowledge that, one only solves a problem if they could identify what the problem is. Pointing back to the assumption that PCSL needs a PMO, it would be required that management of PCSL begins with an assessment of the status of the company. This would be in keeping with the management alignment and the willingness to embrace change.

Interviews with the key stakeholders for this research indicated their willingness and urgency to perform a maturity assessment as a prerequisite to any targeted improvement efforts. A maturity assessment would require a step-by-step analysis of its processes and organizational structure. The findings would enable leadership to determine the strengths and weaknesses of the company as well as its potential for future development.

In order to achieve the aforementioned, PCSL leadership agreed to follow the six-sigma methodology by using the 3A Approach. These approaches as cited in the theoretical framework are, Assess, Analyze and Address.

Assess

This process involves the use of a scorecard through a series of interviews with both leadership and employees guided by the following set six sigma parameters:

1. Leadership alignment
2. Organizational structure
3. Leadership approach
4. Employee involvement
5. Training/ Education
6. Approach to errors
7. Problem solving using collected data
8. Methodologies for continuous improvements
9. Standard work
10. Value stream mapping
11. Accounting support
12. House keeping

This approach was the first, and it was based on the sample template as shown below on Chart 7:

As previously stated, the scorecard is filled through conducting interviews with the leadership and employees of the organization. The outcome of the scorecard

tabulation was represented on a radar charts. The chart reflects the ranking from one (1) – five (5), the Six sigma ranking based on the different Six Sigma parameters. Note, the lower the maturity level of the organization, the closer the score is towards to the center of the chart.

Chart 7 Maturity Assessment Template

Parameters	1	2	3	4	5	Score (1-5)
Leadership alignment	No leadership alignment for process improvements	Leadership 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 project. Some trained resources available.	Trained and committed resources supporting projects	
Leadership approach toward Lean	Company executives demonstrate no understanding of the Lean approach	Executives demonstrate an understanding of Lean approach	Executives demonstrate an understanding of 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. Executives have full understanding and faith in Lean: leadership prepared for accelerated biz improvement.	
Employee involvement	Little or no involvement in process improvements	Involvement of people in process improvements to some extent and people are eager to work in teams	People from cross-functional teams whenever a problem arises.	Quality improvements 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	

Parameters	1	2	3	4	5	Score (1-5)
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.	
Process capability	The area of assessment has sigma level less than or equal to 1, for its most critical process.	The area has sigma level greater than 1 but less than or equal to 2.	The area has sigma level greater than 2 but less than or equal to 4.	The area has sigma level greater than 4 but less than 6.	The area has sigma level greater or equal 6. Cpk is greater than or equal to 2	
Approach to errors	Errors will happen; inspect them out; accept cost of scrap and rework; deal with customer complaint.	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.	
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, materials flow and administrative process function but are current nor displayed. Thinking of internal	All standard work procedures can be seen in most areas. Process owners know the what, why, and how of their areas. Ownership taken to use standards and keep them current.	Standard procedures are current and posted in appropriate areas.	Employees have a quick and free access to all standard work CI to operations reflected in procedures.	

Parameters	1	2	3	4	5	Score (1-5)
		customers begins.				
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 improvement.	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.	
5S House keeping	Disruptive and messy, no formal workplace organization standards in place. No order, area untidy.	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. Team investigation 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"	

Source: Lean Six sigma

Analyse

This next phase of the maturity assessment starts when the company or organization's leader receives all the scorecards of the questionnaires from the different team members and these are mapped in a radar chart. At this point the most important outcome is to determine which parameters are the most important to start working on.

To achieve this, a bar graph with the scores of each of the parameters is represented and an average of all the scores taken. This is a six sigma technique which permits the average of all the individual scores from the questionnaire to be calculated. The result is compared to a Lean Six Sigma maturity Index. The parameters that receive the lower scores indicate those that require immediate attention.

The determination of the "maturity gap" which is the difference between the Lean Six Sigma Maturity index and the maximum score of 5, concludes this analysis phase and the address phase begins. The maturity gap obtained from this work was three (3).

Address

This phase of the maturity assessment starts when the maturity gap analysis is completed, and the key parameters for improvement are determined based on the gap analysis. This last phase consists of gathering all the different department and function group leaders to discuss the weaknesses of the company and begin the process of addressing them.

One of the better recommended techniques to employ at this stage is the brain-writing technique. This technique involves each leader writing down his or her ideas to address the weaknesses identified. 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 in

the open, each idea. After the written ideas are compiled, then a decision tree diagram is drawn. Thereafter actions deemed attainable are then to be represented in a Gantt chart and pursued as planned.

4.2 Analysis of the different types of PMO

Information reviewed both from the PMBOK and other project management offices all concur, that there are three (3) basic types of PMO's based on their degree of influence and control over the projects within the organization: Supportive PMO, Controlling PMO, and the Directive PMO.

4.2.1 Supportive PMO:

This PMO is primarily one that provides on-demand expertise to the organization using its templates, access to information, best practices, and sharing of data collected from other projects. This type of PMO is quite suitable for organizations or companies where projects are done successfully, yet not with firm control systems, and there is the need for additional control. The degree of control with this type of PMO is low. (Reiling, J. 2014).

4.2.2 Controlling PMO

This type of PMO provides support and compliance through various means. It also requires that the support be used by adopting specific project management frameworks, methodologies; templates, forms tools, and PMO controlled set of rules. It ensures conformance to governance among others. The degree of control from this type of PMO is moderate. (Reiling, J. 2014).

4.2.3 Directive PMO

This is perhaps the PMO type with the highest control of all three (3) PMO's. This PMO essentially "takes over" the project by providing project management experience and resources to manage the projects. As the organizations undertake projects, the PMO assigns a professional Project manager for each of the projects, creating a consistency of reporting from

each project manager back to the directive PMO. By this means, a higher level of professionalism is implemented with each project. This type of PMO is more effective for large organizations that run various projects concurrently. (Reiling, J. 2014).

In the analysis of all three PMO's it was realized 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 peculiarities researched and understood that, one can propose a suitable PMO for that organization.

In this case study, PCSL's structure and culture undeniably requires a PMO. This is based on the results from the respondents as highlighted in the results chapter. The PMO that was chosen based on the results and the analysis of different PMO types based on the current status and culture of PCSL is that of a **hybrid** of two PMO's (Supporting & Controlling PMO's). The general inclination from stakeholders was that they were more comfortable with a medium where by PCSL enjoyed the full characteristics of a traditional Supporting PMO with a strong compliance governance characteristic of a Controlling PMO.

For example, the results of the interviews conducted for this research showed that lack of personnel to implement processes and procedures even when these are unanimously agreed to, is a major setback for the company. There is also the resistance from senior management to directly take up the mantle, making it necessary that an independent body or process is set up to administer and evaluate any project management processes and methodologies introduced to the organization. Notwithstanding the previously

mentioned, the leadership is unwilling to relinquish control to an independent body to manage its affairs.

It is important to note that choosing a type of PMO, is directly linked to the results of the assessment conducted. The weaknesses identified from the maturity assessment via the use of questionnaire further add up to the argument of which PMO to choose at this time.

For example, employee involvement in decision making, the approach to error correction, training and education and the use of methodology for continuous improvement. Each of these parameters helped in determining which PMO was better suited for PCSL. The analysis of the different types of PMO revealed that PCSL at this point of its maturity could not embark on a Directive PMO. The reason was that, the maturity level of PCSL is still very much in its infancy. This means that a Directive PMO which essentially controls the entire project, might be too drastic for a relatively young company. It was assumed that a Directive PMO might be required when PCSL obtains at most a maturity level of 4 or 5 (with 5 being the highest maturity level). At that level (4-5), PCSL would be expected to be quite familiar with most project management process templates. Currently PCSL is unaware of many of the basic project management processes according to findings of this research.

On the other hand, using the same results of the maturity assessment and the current operational culture of PCSL, together with the analysis of the functions of the other two types of PMO's, thus Controlling PMO and Supporting PMO, it was realized that a marriage of both would be most suitable. Based on the consultation exercise with the senior management of PCSL, it was realized that the company did not want to relinquish total control of its current modus operandi, therefore a Directive structure PMO would not be suitable. The consensus expressed was that the company preferred to be supported by the provision of an on-demand expertise to the organization.

The use of its templates, and the sharing of data collected from other projects, constitute the inherent characteristics of a Supportive PMO. However, the leaders also wanted the company to observe a culture of governance and best project management practices. For these, it was determined that a Controlling structure PMO would be best suitable. The common objectives the PMO needs to satisfy are:

1. Implement a common methodology
2. Standardize terminology
3. Introduce effective repeatable project management processes
4. Provide common supporting tools
5. Ultimately, to improve levels of project success within the organization

Once the PMO satisfies these objectives, then it should be a starting point for PCSL's PMO. These analysis and results above described led to the choice of a hybrid of both PMO's.

Chart 8 PCSL Maturity Assessment Template

PMO Types	Characteristics	PCSL Needs	Suitable Maturity Level
Supporting	- Provide templates - Provide Best practices - Provide Training - Share resources	Support with tools & templates and sharing of resources from other projects	1 - 2
Controlling	-Provide governance and conformance	Encourage the following of best practices and conformance to industry standards	2- 3
Directive	-Directly manage projects -Provide strong governance frameworks		4 - 5

(Source: Author)

Chart 9 Types of PMOs & level of control

PMO TYPES	RESPONSIBILITY	LEVEL OF CONTROL	SIZE IT BEST FITS (ORGANIZATION)
Supporting	<ul style="list-style-type: none"> • Provide templates • Provide Best practices • Provide Training • Share resources 	Low level of control	<ul style="list-style-type: none"> • Small size organizations • Medium size
Controlling	<ul style="list-style-type: none"> • Provide governance and conformance 	Moderate level of Control	<ul style="list-style-type: none"> • Small size organizations • Medium size
Directive	<ul style="list-style-type: none"> • Directly manage projects • Provide strong governance frameworks 	Top level control	Large organizations

(Source: Author)

4.3 Roles and Responsibilities assigned to PCSL's PMO

Based on the maturity assessment and the recommended PMO type, these series of roles and responsibilities are proposed for the hybrid PMO for PCSL. These roles and responsibilities are from the needs assessment and improvement potentials envisaged for PCSL. It is critical at this juncture not to be overly academic with the assignment of the roles and responsibilities to a new PMO. Often, the simpler and more realistic these roles and responsibilities are, the easier and better, they are carried out. One needs to be cognizant of the human resource limitations at PCSL at this moment of its development, and slowly assign bigger responsibilities as it matures into the use and management of its project management processes. The basic responsibilities according to research into PMOs are as follows:

4.3.1 Establishing Project Methodologies

Establishing the methodology to execute a project successfully is a key role of a PMO. This is the foundation of the processes and procedures upon which

the organization is to rely at most, of course with constant reviews and updates of its processes to attain the desired goal.

The review of PCSL's status reveals that it would be best to start with a non-complex methodology for its operation. This bears in mind that the organization has never had any structured methodology of doing things. Project management methodologies can be rather complex, demand sophisticated set up, and often very costly. Hence, the recommended methodology comprises a non-complex, basic project management process of developing or creating:

Project Charter: This would outline very clearly the overall vision of the project in question, as well as articulate the objectives and goals of the project to all its stakeholders.

Work Plan: would set out detailed schedules of activities, resources, time frames and the deliverables of the project to the project team.

Governance Plan: This outlines the roles and responsibilities to be assigned to each member of the project team.

WBS: This would define the specific deliverables due from each team member at each stage of the project.

Risk Analysis identification: This would allow the team to list as many as possible the potential problems or deviances that have a probability of occurrence create impact, and their possible solution or mitigation.

Communication Plan: Establishes the protocol, procedure, and the methods to communicate project information and issues among members of the team.

Forms and Templates: This would establish the list of simplified tools, (forms and templates) that the project team would use to effectively communicate, report and do record keeping as per industry best practices. Templates such as Project Scheduling (Gant Timeline), Project budget, Simple project tracking template, Daily task manager, Assumptions, and risk managements templates.

4.3.2 Project Tracking

The responsibility of project tracking in a PMO is paramount. This is one of the roles of the Project manager. The lack thereof of any progress or delays and their possible impact on the deliverables of a project, can be traced to its tracking. This is very critical to every project. Based on researched cases, a PMO of the size anticipated for PCSL, normally should track its project in three (3) steps:

Collecting project status information: This would entail the routine gathering from all project team leaders, updated work plans, issues, change orders and any other relevantly recorded project data.

Consolidation and analysis of the data collected: This mechanism would allow all data collected to be analyzed and the results compared to a benchmark set using the six-sigma guidelines, and then communicated to the management team for their review and possible action.

Corrective Action: This process allows for an official endorsement of the corrective decisions decided by the management team through a process of change management.

The PMO has the responsibility of gathering and archiving project experience and reusable data for future projects. This would form part of its methodology to close the project. The Project manager is charged with this responsibility.

4.3.3 Project Support

One of the responsibilities of a PMO is to serve as Project Support. This is huge and widely encompassing responsibility that often requires multiplicity of inputs and efforts from both internal and external resources. Hence it is coordinated by the PMO Project Executive.

Research into the current status of PCSL clearly indicates that PCSL need to be provided with a support mechanism so as to maximize its full potential with regards to delivery of projects. When a PMO serves as a project support, it embodies the following responsibilities:

The PMO provides a centralized location for planning, analyzing, negotiating, re-orienting project direction and concerns in line with the project baseline to the client and stakeholders.

One important support system a PMO provides is the training to team members of relevant project management tools and techniques applied to the project in question.

The PMO in its support role would formulate some in-house consultancy services geared at specific project issues that would be administered to the project team from time to time.

The PMO also supports the organization by developing a cadet of competent project managers through its continuous training sessions. These project managers would then ensure that the implementation of a project is done effectively following the established methodologies set out by the PMO through consultation with its stakeholders.

Chart 10 PMO Roles & Responsibilities Chart

No.	Responsibility	Role/SME	Owner	Creator	Approver
1	Establishing project methodologies <ul style="list-style-type: none"> • Create project charter 	Project Executive & Project manager	PMO	Project Executive(PE)	Project sponsor
	<ul style="list-style-type: none"> • Create work Plan 	Project manager	PMO	Project manager	Project Executive
	<ul style="list-style-type: none"> • Governance plans 	Project manager	PMO	Project manager	Project Executive
	<ul style="list-style-type: none"> • Work Break down structure 	Project manager	PMO	Project manager	Project Executive
	<ul style="list-style-type: none"> • Create Communication Plan 	Project manager	PMO	Project manager	Project Executive
	<ul style="list-style-type: none"> • Create forms and Templates 	Project manager	PMO	Project manager	Project Executive
	<ul style="list-style-type: none"> • Prepare Risk Analysis Plan 	Project manager	PMO	Project manager	Project Executive
2	Project tracking <ul style="list-style-type: none"> • Collecting project status information • Consolidate & Analyzing of data collected. • Implementation of corrective action, if required 	Project manager	PMO	Project Manager	PMO-Project Executive
3	Project Support <ul style="list-style-type: none"> • Provide a centralized location for all project data, for sharing and analyzing project development. • Develop competent project managers through training & mentoring 	PMO-Project Executive	PMO	Project Executive	Project Executive

(Source: Author)

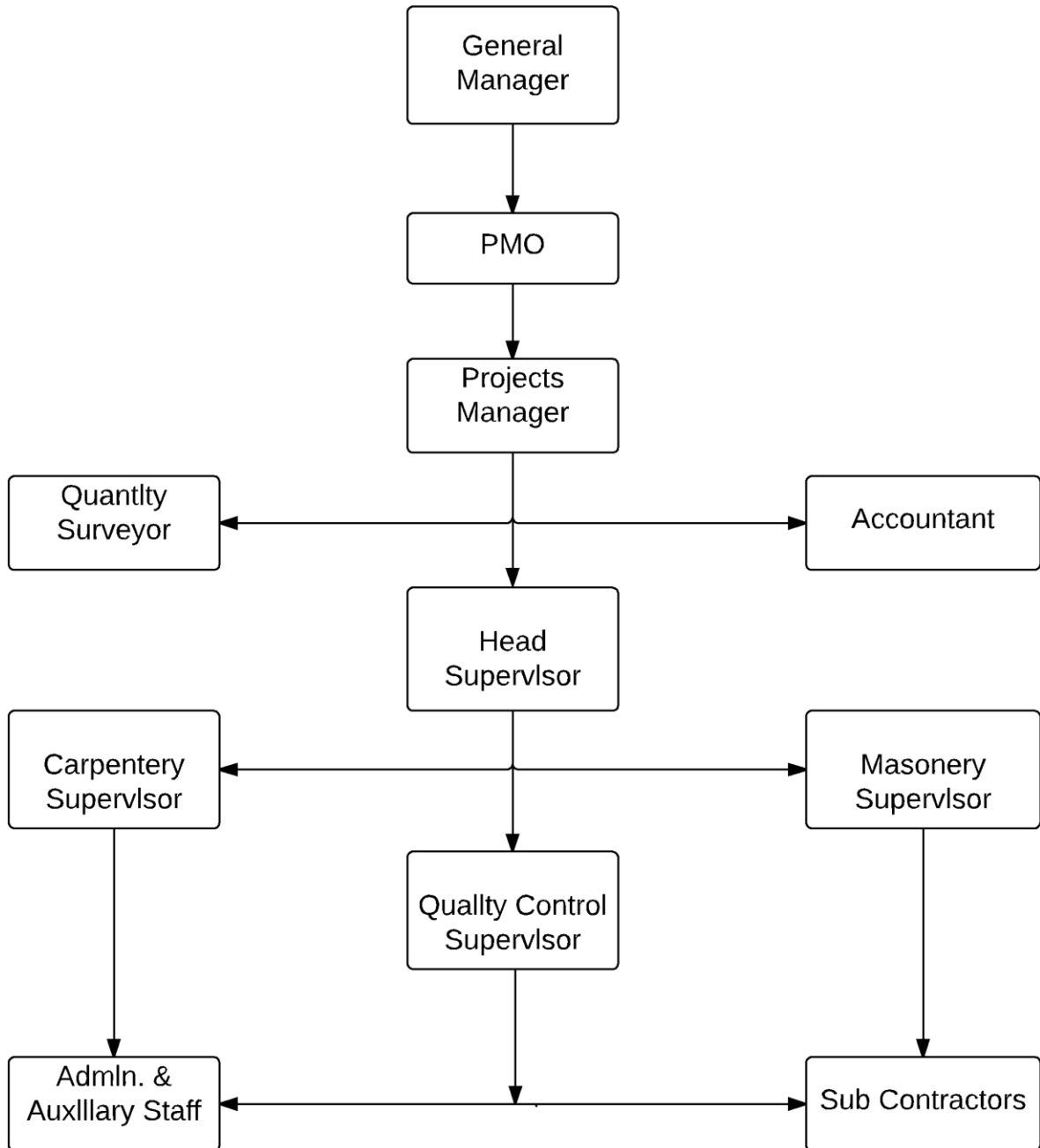
4.4 The location of the proposed PMO within the existing management structure of PCSL

Since in the 90s when Project management became a household name in the productive sectors of society, it equally became apparent that lots of business models and organizational structures had to endure the undesirable state of change. These changes while not easily attainable, they have demonstrated in their majority to have solved problems that organizations faced with misalignment between projects and strategic management. Changes can be costly and often uncertain, mostly due to the size, culture and organizational complexities. The appropriate positioning of a PMO on an organizational management structure can only do it well if not better (Rodriguez, R. 2015)

Based on all the maturity assessment results as well as the analysis and selection of a suitable PMO, PCSL could begin solving its maturity problems by locating the PMO in a strategic position on its management structure. This will allow for speedy implementation of processes and procedures and the PMO can harness considerable momentum to tackle the most urgent project related matters. Based on what has been determined this far with this research, PCSL stakeholders input into the location of its PMO is apparent. While the questionnaire did not directly deal with location of PMO on its current organizational structure, however during stakeholders meetings, the subject was given consideration. The awareness generated as a result of a low rated maturity level also serves to strategically look at the merits of placing PCSL's PMO very high on its management structure. For best results it was decided that a PMO placement directly under the mandate of a CEO or company director, would give it the control characteristics it deserves to be functional and apt for its intended purpose (see Chart 11).

Chart 11 PMO Location on Organizational structure

NEW PCSL ORGANIZATIONAL STRUCTURE WITH A PMO



(Source: Author)

4.5 Implementation Plan for PCSL's PMO.

The maturity assessment results allowed for the determination of the most fitting PMO for PCSL. However, now that the role, scope and outcomes of PCSL's PMO have been identified, it would be timely to implement the new organizational structure.

The implementation plan is directly linked to the results of the assessment in that, the lack of consensus through the organization and the result of not sufficient employee involvement in decision-making amongst other results analysis, help determine the structure of this implementation plan.

The first requirement is to consult with all stakeholders about the introduction of the PMO into the organizational structure. This process can be carried out through training and consultation with all team members as well as top management.

Secondly, a review of the skills levels available to carry forward the new structure has to be ascertained. The history of the organization's performance is analyzed so as to establish what the new PMO is to prioritize and target for the immediate, or long time improvement. All these are to be measured with the organizations strategic plans and baselines.

Once the skills have been successfully identified and the need assessment approved, the processes and procedures that are required to implement the methodologies set out for this PMO can be established. These processes and procedures are carried out using the processes templates developed specifically for the organization. Communication templates as well as reporting templates are very important tools that all team leaders should be trained to use and understand.

Finally, a check and balance system through a constant review of the performance and adherence to methodologies set out for the effective operations of this PMO is to be implemented. This would allow for growth inherent changes to the PMO to be reviewed by the executives of the organization as required, so as to make the PMO current and relevant to the organization.

Chart 12 PMO Implementation template - Phase one (1)

PHASE	STEP	TASK	DETAILS	OUTCOMES
One	1	Project planning and Initiation		Project plan and schedule
	2	Assess current environment	Resources (Staff, skills set, Funding and Project Tools Organizational Readiness (Culture, Organizational support) Governance and Escalation mode	Strengths, Weaknesses, Opportunities, Threat Analysis
	3	Establish Vision & Mission	PMO mandates PMO Policy & Direction Critical Success Factors PMO Models	Consensus, PMO Vision & Mission
	4	Establish Goals & Objectives		Consensus, PMO Goals & Objectives
	5	Develop Business case	High Level PMO Requirements Implementation Strategies & Schedule Cost Estimates	Business Case Document

(Source: Author-Adapted from PMMajik)

Chart 13 PMO Implementation template - Phase two (2)

PHASE	STEP	TASK	DETAILS	OUTCOMES
Two	1	Define Organizational Structure Staffing Requirement	Roles & Responsibilities Identify PMO Life Cycle Framework Identify PMO Process Domains	Organizational Structure & Staffing Requirements
	2	Facilitate Supporting Governance & Escalation Structure	Integrate PMO with current Governance processes if any Facilitate Buy-in consensus	Updated Governance & Escalation Structure
	3	Define Project management Methodology Framework	Define PMO Lifecycle	Project management Methodology Framework
	4	Establish Goals & Objectives		PMO Processes & supporting documentation
	5	Establish Review processes & performance metrics	Balance scorecard, # of feedback, etc.	PMO Review Metrics
	6	Develop Training Requirements	Project Management Training or certification Coaching or mentoring skills development Sourcing & relationship management skills	Training requirements

(Source: Author- Adapted from PMMajik)

Chart 14 PMO Implementation template - Phase three (3)

PHASE	STEP	TASK	DETAILS	OUTCOMES
Three	1	Develop deployment plan	Schedule Resources Costs	PMO deployment Plan
	2	Deploy PMO	Acquire/ Develop PM Methodology Add PMO Staff Pilot PMO	Program assessments Semi-Annual PMO Review

(Source: Author- Adapted from PMMajik)

5. CONCLUSIONS

A maturity assessment was conducted using a questionnaire modeled after the six sigma methodology. The aim of the maturity assessment was to determine the strengths, weakness and opportunities as well as needs of PCSL. The results of the assessment is to guide the selection of a suitable PMO for PCSL Based on results obtained from the maturity assessment, it was concluded that:

1. PCSL has strengths in certain project management areas even though these areas are not formally recognized as project management processes. The areas identified were, Leadership approach to Lean, approach to errors and partial training for employees. PCSL maturity assessment also reveals weaknesses in many of the other assessed areas. Problem areas include: inadequate employee involvement in decision-making, Low levels of continuous education geared towards process improvement. The poor collection and use of data in problem solving, non-implementation of standard work procedures, absence of value stream mapping and Lack of developmental programs to boost workers confidence and pride.
2. The maturity level assessment exercise concluded an index of one (1) on a 5-point scale. The index of one (1) on six sigma reading corresponds to Maturity level 1 which is **INITIATION LEVEL** – This index reading can be somehow misleading due to the fact that one (1) is the lowest maturity level on the six sigma scale of maturity level classification. Whilst, this low rating - 1, might suggest that every category was poorly rated in this exercise, the reality is that certain individual categories rated highly as can be interpreted in the graphs in appendix 2.

The overall maturity index average of 1 – on a scale of 5 led to conclude that there are many project management improvement opportunities to be tapped into by PCSL. The lowest rated categories show they are the most urgent

categories to attend to. This means work must be started promptly to get these processes and procedures to standard so by the next evaluation, the company can aspire to the next higher level. What better way to start than tapping into the project management processes of using a PMO?

3. Based on the analysis of the maturity assessment, it was concluded that PCSL needs a PMO. This is a further confirmation of one of the assumptions established at the very beginning of this project.

The chosen PMO should fit within the current structure of the company and should use its structured organizational strengths to support the current status of the company rather than to start all over from scratch. This is in recognition of the culture, size and lack of trained and skilled personnel in PCSL at this time to manage the new PMO process.

4. As per the results of the maturity assessment, three (3) basic types of PMO were analyzed. The analysis of the capabilities and levels of control on an organization of each of the 3 – PMO's helped conclude that, the most suitable PMO type at this stage of PCSL's development should be a combination or hybrid of a Supporting and Controlling type of PMO.

For the first time in PCSL's history, there was the use of stakeholders' consensus on any matter of relevant to the company. This is very important as, it signals the beginning of seeking and applying stakeholders' expectation into the improvement process of the company's maturity traits. A hall mark of project stakeholder management in the project management processes.

5. The roles assigned to the chosen PMO, should start with the three basic and widely accepted project management responsibilities of, Establishing project methodologies, Project tracking and Project Support, for PCSL's projects. These are the main responsibilities identified as critical for PCSL at this stage

of its development. Other roles as may become necessary would then fall under these main roles and responsibilities herein identified.

6. As per the location of the PMO on the management structure of PCSL due to other important aspects such as company's size, culture and project management maturity, the new PMO should be a central point of the organizations effort into shifting from Initiation to managed maturity. This means that the PMO should structurally be located immediately below the mandate of the CEO or Director of the company. In this way, the project manager can directly be in control of helping formulate and implement the tools and templates required to get the company onto the path of project management best practices.
7. It is of little relevance to propose a PMO if there is no implementation of it. Therefore an implementation plan has to be introduced very carefully, so as not to incite skepticism from some stakeholders and team members of the introduction of a new structure, which many consider as just a waste of time and money.

PCSL maturity is in its infancy, therefore any implementation proposals for its PMO should be carefully and strategically weaved into the existing fabric of the company. This would help galvanize support for its PMO.

Stakeholders input into the implementation plan of PCSL's PMO suggested, outlining the different stages of implementation of the PMO, from consultation with stakeholders, through training and determining the priorities areas for target by the PMO in the immediate and long term, and finally a check and balance system to monitor its relevance and growth.

8. Finally, the relevance of this research as proven is to ascertain that "yes" PCSL does need a PMO to help it maximize its potential and to remain

sustainable in the realization of its projects. As such, a PMO should be established to support and control the operations and project management process of PCSL.

6. RECOMMENDATIONS

Based on the research and assessment conducted of the current status of PCSL maturity and the potential for growth, the following are recommended:

1. A maturity assessment should be conducted by the PMO through the project Executive and Project manager at least every two (2) years to update the status of PCSL and to further determine the project management strengths and needs. The PMO shall be responsible for this assessment.
2. Whenever a new PMO is set up, that it establishes a routine review program preferable every six (6) months by the Project leadership to analyze the relevance of its existence so as to advise management and stakeholders if and when PCSL would be better served with another PMO type based on the projects it embarks on.
3. In order to streamline the roles and responsibilities of the PMO, and to establish clarity of responsibilities and their relevance to the particular projects, a review panel within the management and staff structure be set up. It will be charged with the task of reviewing the existing role of the PMO and determine its adequacy or lack thereof.
4. A very systematic implementation plan of the PMO should be introduced early enough to all stakeholders by the project manager through various consultations, and group meetings. This would allow consensus building to agree on a smooth transition to the successful implementation of the PMO. The process should be carried out by senior management.
5. It is highly recommended that PCSL adopt the use of a PMO on its organizational structure to optimize the results of its future projects. The simple reason is that, stakeholders generally show a lack of confidence in the

status quo yet are unaware of any processes that work. The company is not in a good financial position and needs structural assistance moving forward.

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8. APPENDICES

Appendix 1: Level of Maturity assessment questionnaire

Leadership Alignment:

1. A strong and determined leadership is required for the process improvement of a company. In your opinion, do you think PCSL leadership has demonstrated an alignment to process improvement?

- R1-[] No leadership alignment for process improvements
 R2-[] 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.
 R3-[] Leadership aligned with process improvements, visible and active selection and review of projects. No resources available to support projects
 R4-[] Leadership is aligned with vital few metrics, visible selection and review of projects. Some trained resources available
 R5-[] Trained and committed resources supporting projects

Leadership approach towards Lean:

2. Do you think the Leadership of PCSL has a good grasp or understanding of the Lean approach to maximizing productivity?

- R1-[] Company executives demonstrate no understanding of the Lean approach
 R2-[] Executives demonstrate an understanding of the Lean approach
 R3-[] Executives demonstrate an understanding of Lean but do not have full faith
 R4-[] Executives demonstrate good understanding and have faith in Lean. Leadership committed but not prepared for accelerated biz improvement
 5-[] Sr. execs have full understanding and faith in Lean; leadership prepared for accelerated biz improvement

Employee involvement:

3. Are PCSL employees involved in the decision making for the process improvement of the company?

- R1-[] Little or no involvement of people in process improvements
 R2-[] Involvement of people in process improvements to some extent and people are eager to work in teams
 R3-[] People form cross-functional teams whenever a problem arises
 R4-[] Quality improvement, problem solving and corrective action teams in place. 25 to 50% of employees involved in teams
 R5-[] 50% or more involved in teams; open access to top management; empowered to stop the process for quality

Training/Education:

4. Does PCSL provide training or any form of education geared towards process improvement or quality improvements

- R1- No training on Lean tools or quality improvement tools, methodologies or even concepts
- R2- Few team members have heard about different concepts of improvement methodology but not formally trained
- R3- Team members are trained in some basic concepts like 5S, Lean overview, 7 QC tools
- R4- Team members have good understanding of process improvement methodologies
- R5- More than 5% of employee time devoted to training and implementing improvements

Process Capability:

5. How does PCSL use the Sigma levels indices in its capability process assessment?

- 1- The area of assessment has sigma level less than or equal to 1, for its most critical process.
- 2- The area has sigma level greater than 1 but less than or equal to 2.
- 3- The area has sigma level greater than 2 but less than or equal to 4.
- 4- The area has sigma level greater than 4 but less than 6.
- 5- The area has sigma level greater than or equal to 6. Cpk is greater than or equal to 2

Approach to Errors:

6. How does PCSL deal with errors on site generally?

- R1- Errors will happen; inspect them out; accept cost of scrap and rework; deal with customer complaints
- R2- Although errors happen but some initial thought prevails to implement or design error-free systems using Lean
- R3- Inspection and control only; some data collection to regulate variance
- R4- Inspection, control and improve; data collected to regulate variance
- R5- Zero-defect quality mindset

Data driven problem solving

7. How accurate and meticulous does PCSL collect and use data to improve its operations and future projects?

- 1- Insufficient data available for key processes needing improvement
- 2- Organization does not use data driven problem-solving methods to a great extent. Data collection processes are not systematic and in place
- 3- Organization uses data driven problem-solving methods. Data collection is systematic and efficient, although MSA not done extensively
- 4- MSA is done extensively and people know the tools needed to analyze data

5-[] Org uses data driven problem-solving methods across the spectrum

Methodologies of Continuous improvement (CI)

8. What methodologies are used in the company to guarantee continuous improvements (CI)?

- R1-[] No formalized improvement methods exist. No evidence of employees, or managers concerned about CI
- R2-[] Improvements reactive – usually come from management, engineering, supervision or when a customer complaint is received. Some training started in problem solving
- R3-[] Some improvement methodology evident; teams sometimes used to develop solutions. CI training supported by management
- R4-[] CI used to advance company. All associates trained. Open documentation and dashboards used to track improvements tied to dollar savings
- R5-[] Methods such as PDCA are known and used by all employees; CI is part of company culture

Standard work procedures

9. Does PCSL have and use standard work procedures to ensure the consistent quality delivery of projects?

- R1-[] No standard work procedures exist. No understanding of the connection between CI and work standards
- R2-[] Some standard work procedures exist to show how the process made, materials flow and administrative processes function but are not current nor displayed. Thinking of internal customers begins
- R3-[] 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
- R4-[] Standard work procedures are current and posted in appropriate areas
- R5-[] Employees have quick and free access to all standard work. CI to operations reflected in procedures

Value Stream Mapping

10. Does the company use value mapping to as a tool for future improvements?

- R1-[] No process is mapped according to the value stream
- R2-[] An understanding of VSM is evident. Some attempts have been made to map a simple process
- R3-[] A number of people have been trained in VSM, some processes mapped. No improvements
- R4-[] Most understand value of VSM. Mapping has uncovered opportunities for improvement. Action plans are in place. Rapid improvement blitzes preceded by VSM
- R5-[] Most processes mapped with results of action plans recorded

Accounting support to Lean

11. Does PCSL accounting system support Lean?

- R1-[] Accounting system provides basic financial data based on cost accounting. There is little awareness of accounting's role in support Lean initiatives
- R2-[] There is awareness that accounting has a role in Lean. Some staff has been trained and initial analysis has been undertaken
- R3-[] All key staff has been trained. Pilot project has begun; department targeting waste in its processes
- R4-[] Key value streams are using Lean. Decisions are being made using Lean financial data. Some initial investigation to review current standard cost methods
- R5-[] Accounting system provides financial data based on measurements at the value stream level and provide support for Lean

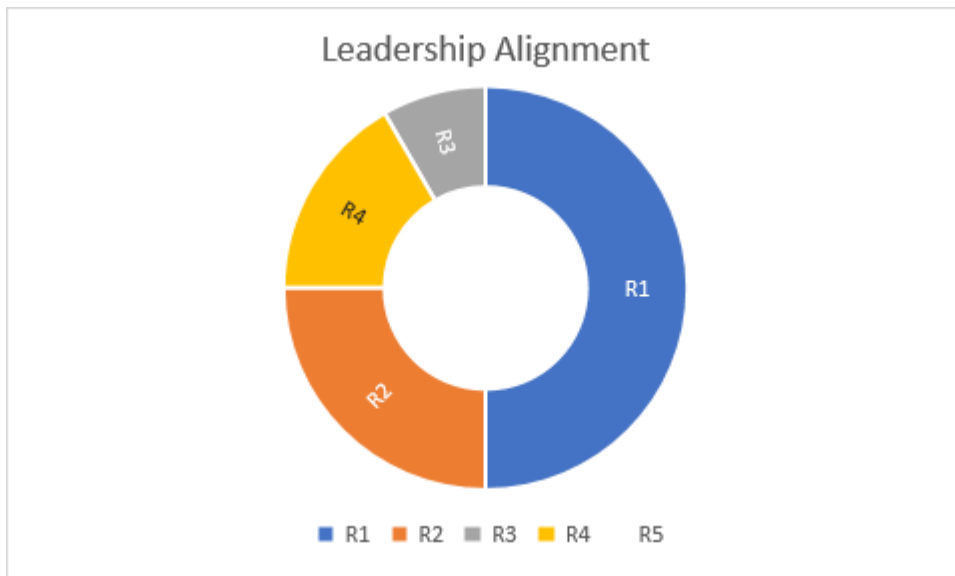
5S House keeping

12. Is the current condition of PCSL work place conducive for workers development and boost of workers confidence and pride?

- R1-[] Disruptive and messy, no formal workplace organization standard in place. No order, area untidy, materials have multiple locations
- R2-[] Company aware of 5S principles but no training underway. Non-routine cleaning takes place
- R3-[] 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
- R4-[] Audit teams assess 5S standards. All areas are working on standardizing processes. Evidence of employee pride noticeable
- R5-[] Clean, orderly, self-maintained; always "tour ready"

Appendix 2: Maturity assessment responses per category

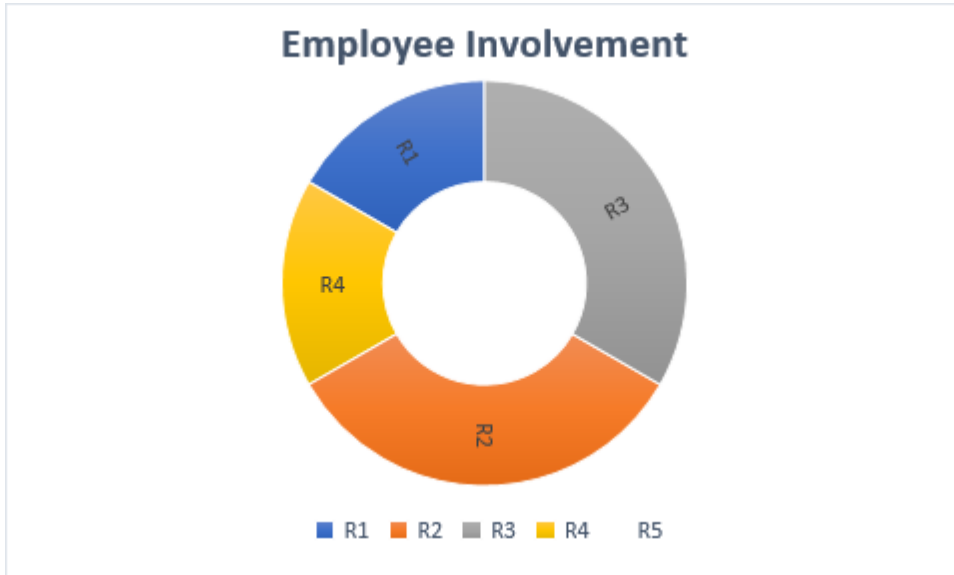
Question 1



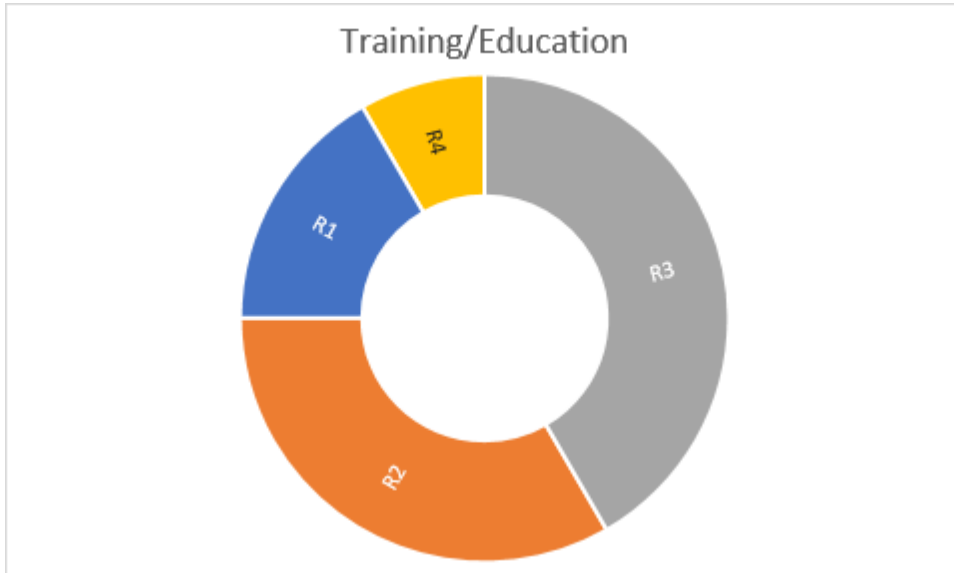
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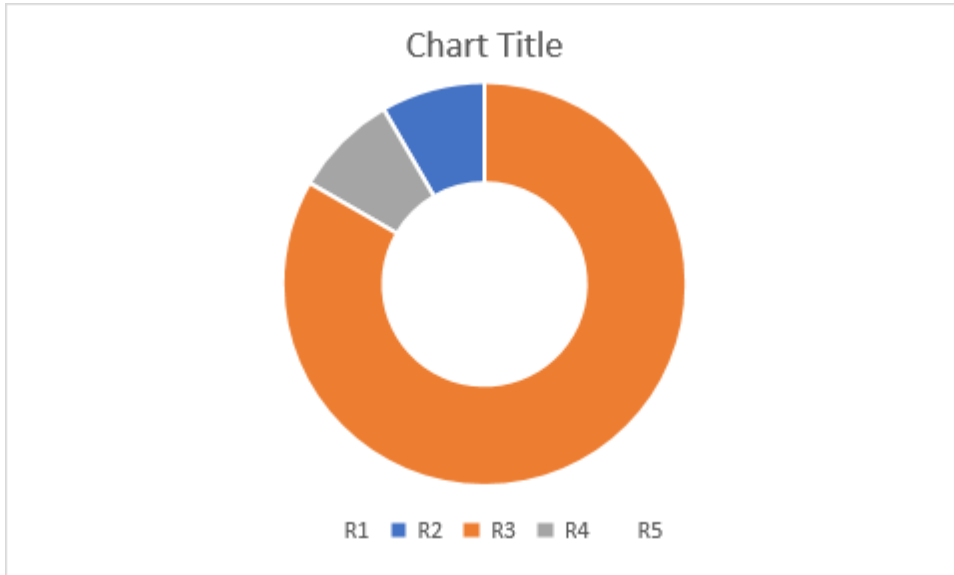
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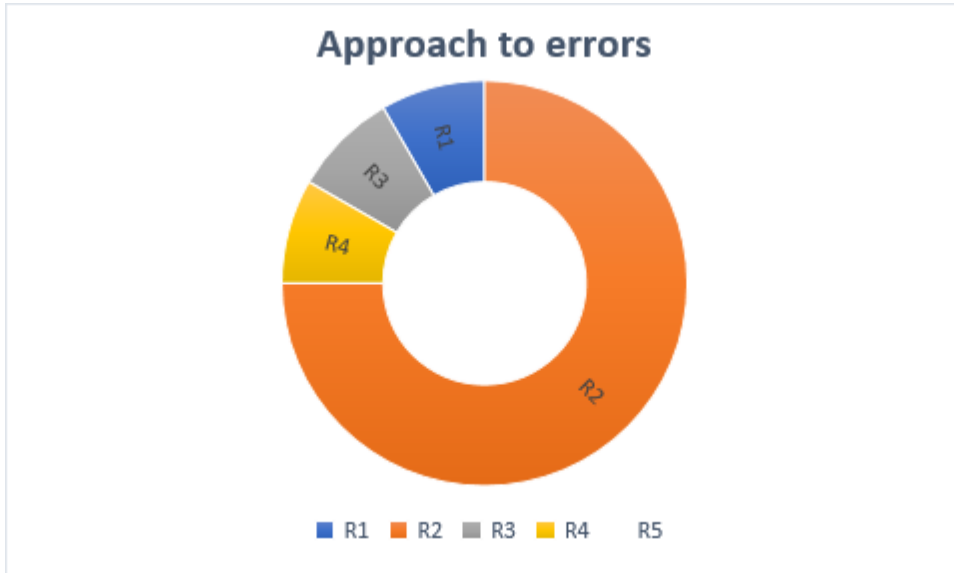
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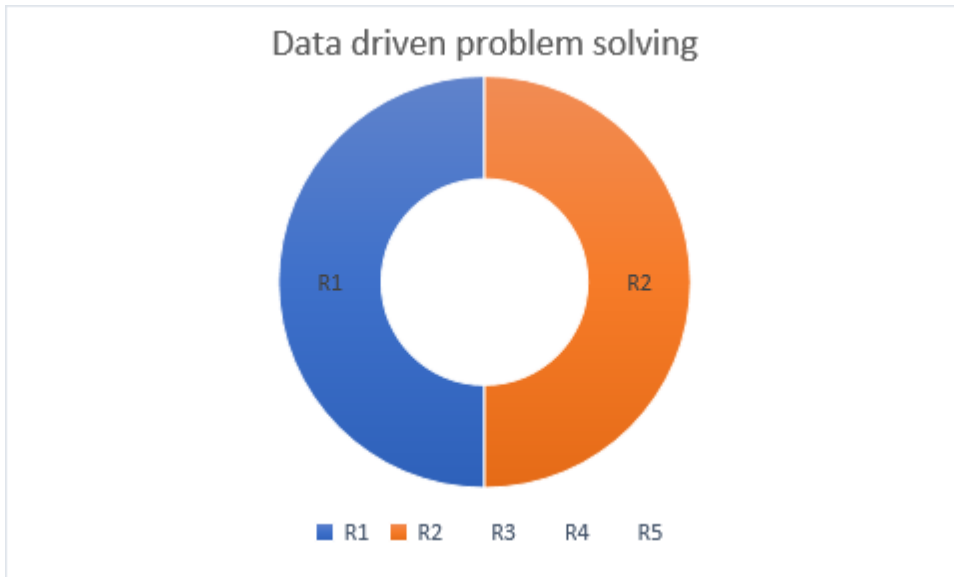
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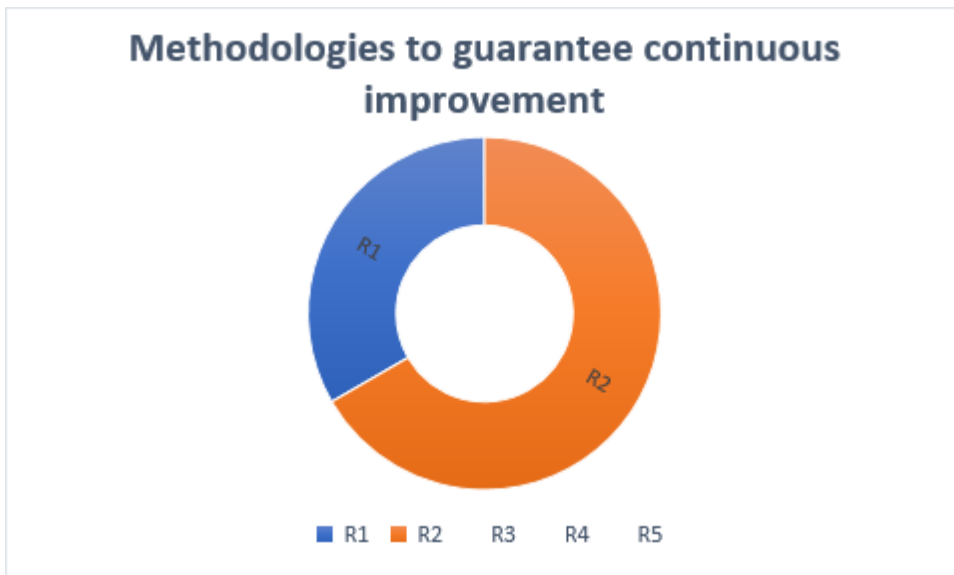
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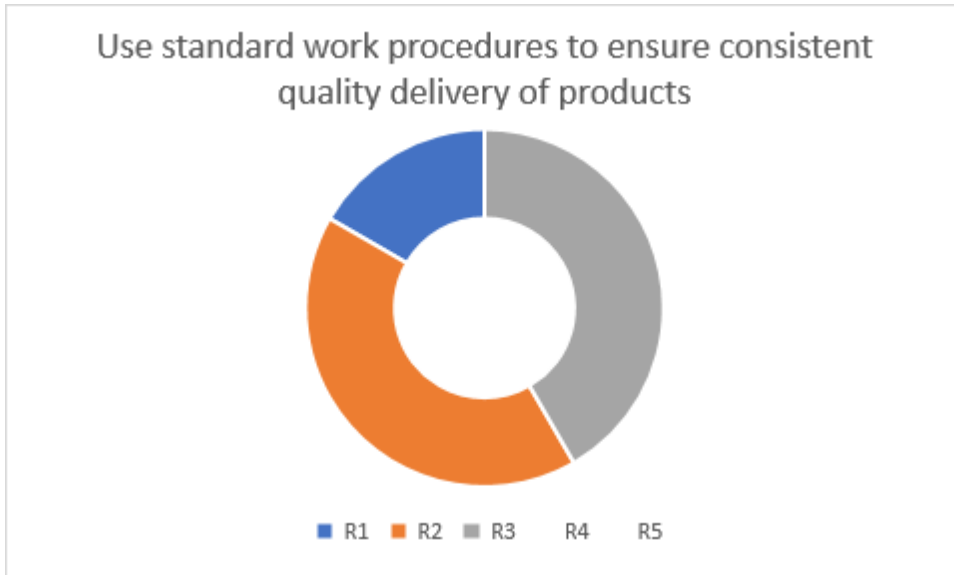
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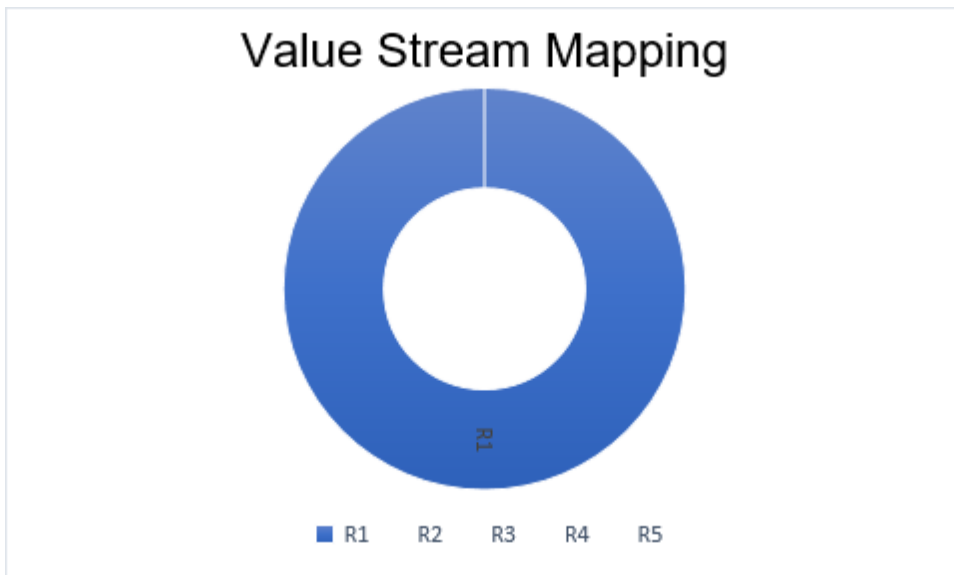
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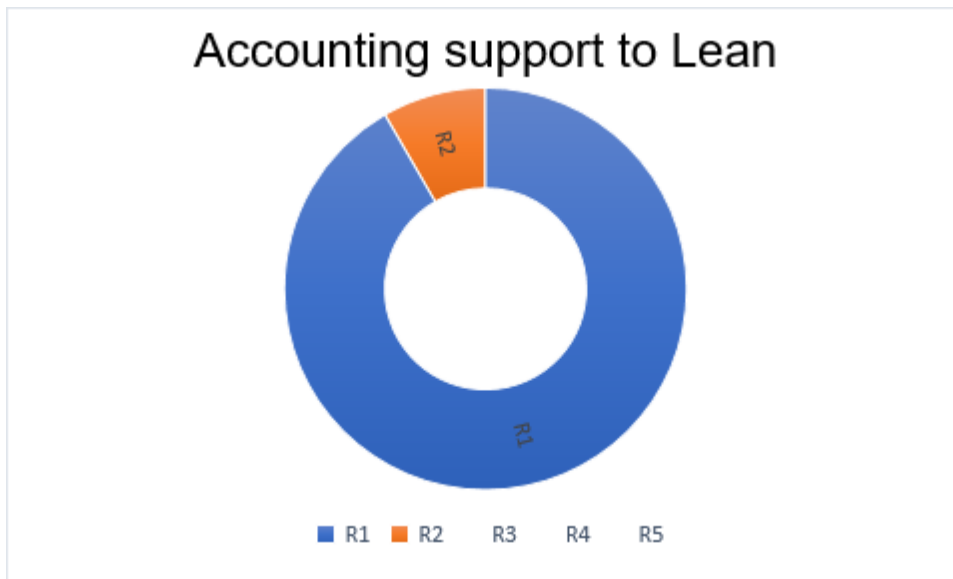
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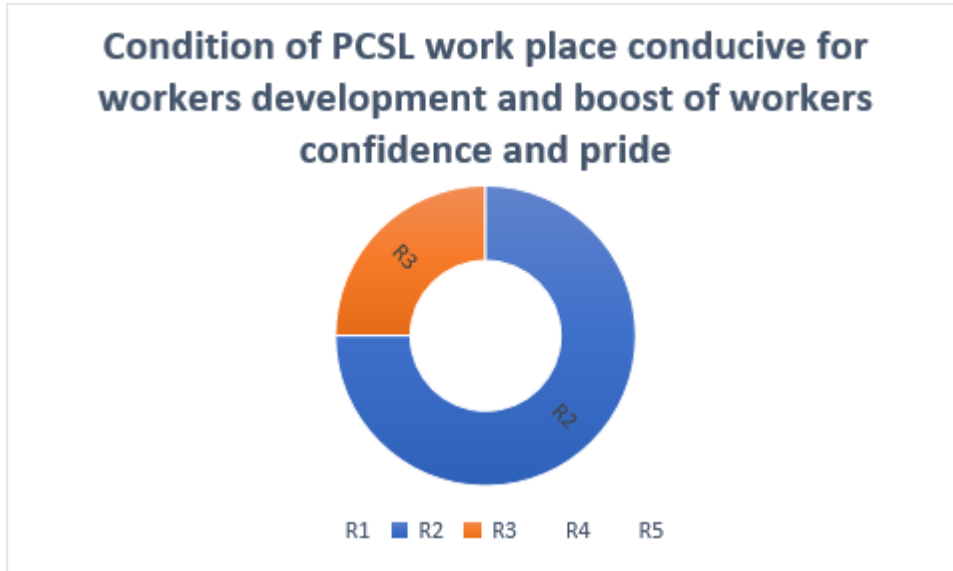
Question 10



Question 11

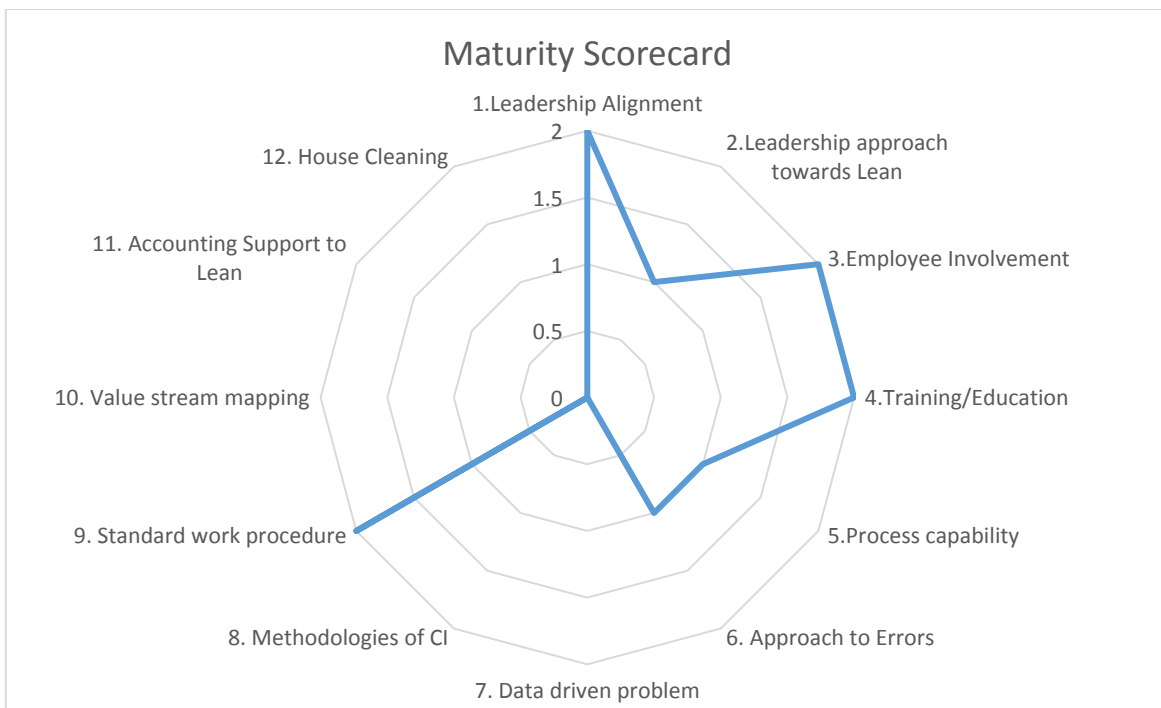


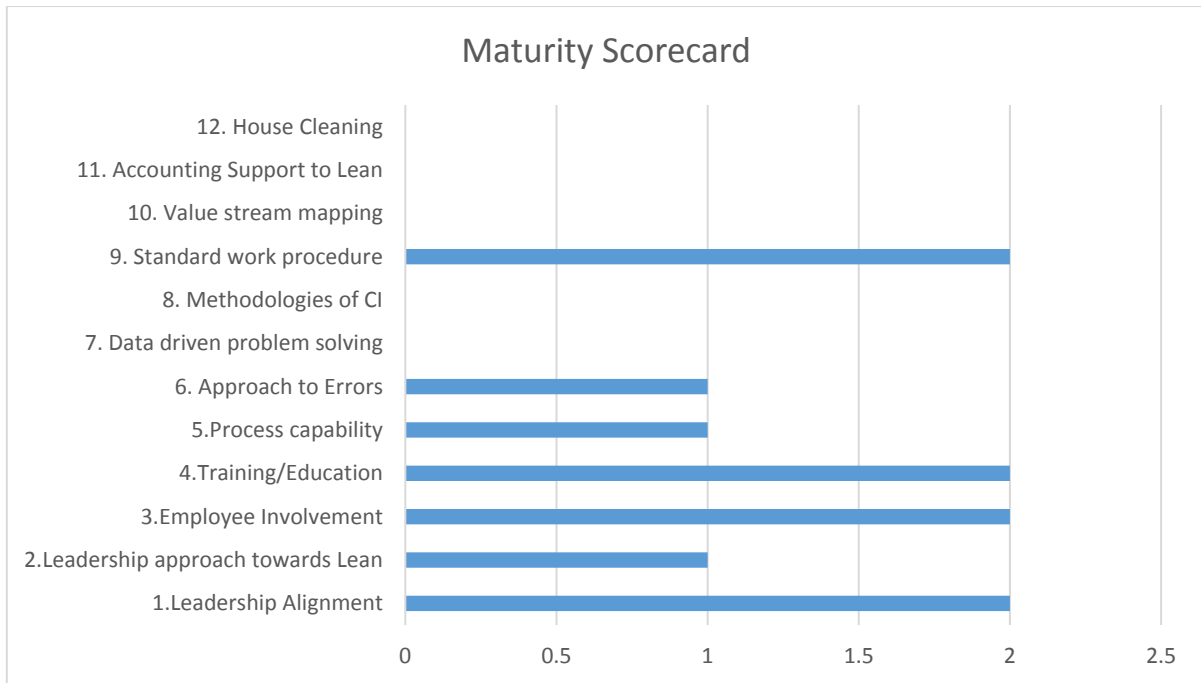
Question 12



Maturity index

Maturity Score Card per category	Median
Leadership Alignment	2
Leadership approach towards lean	1
Employee involvement	2
Training/Education	2
Process capability	1
Approach to errors	1
Data driven problem solving	0
Methodologies of CI	0
Standard work procedure	2
Value stream mapping	0
Accounting support to lean	0
House cleaning	0
TOTAL MATURITY INDEX	1





Appendix 3: FGP Charter

1.5.1 PROJECT CHARTER	
Date	Project Name:
August 27, 2016	1.5.2 Setting up of an effective PMO for small and medium size Construction Company(Contractor)
Knowledge Areas / Processes	Applicacion Area (Sector / Activity)
Knowledge areas: 1.5.3 Project Integration Management, Scope Management, Time Management , Cost Management, Quality Management, Human Resource Managemnt, Communication Management, Risk Management, Procurement Management & Stakeholder Management 1.5.4 Process groups: Initiation, Planning, Execution, Monitoring & Control & Closing	1.5.5 Construction
Start date	1.5.6 Finish date
August 27, 2016	1.5.7 January 29 2017
Project Objectives (general and specific)	
1.5.8 General objective: <ul style="list-style-type: none"> • To develop a Project Management Office proposal for PCSL to maximize and optimize the results of the project done by the company 	

1.5.9 Specific objectives:

- 1 To assess the maturity of PCSL, in order to determine the project management strenghts, improvement opportunities and needs
- 2 To analyze the different PMO types in order to establish the most suitable for PCSL
- 3 To establish the roles and responsibilities to be assigned to the PMO as well as its location on the hierarchy on PCSL organizational management
- 4 To determine the PMO implementation plan for PCSL in order to outline the main steps required

Project purpose or justification (merit and expected results)

1.5.10 In Saint Lucia, there are many small fly by night constrcution companies, many of which do not have the technical capabilities, organizational structure nor the resources to tender for work particularly from major funding agencies such as the EU and or the Caribbean Development Bank(CDB). Therefore the purpose here is to create a fair and equitable avenue for work for most of these companies, by devising a system to integrate or incorporate them into blocks, where they can be effectively directed and managed using Project management process and procedures. The expected outcome is to develop a documentation and templates through a PMO that would help to properly manage small and medium size comapanies so as to create meaningful avenues to compete for works both locally and regionally.

Description of Product or Service to be generated by the Project – Project final deliverables

- PMO Application documents for managing small and medium size Construction Companies.
- Enhanced Templates and Suites of measureable indicators to evalaute project outcomes.

Assumptions		
It is assumed that this project would be developed using experiences, data and information gathered from Prudy's Construction Services Limited (PCSL), a medium size Construction Company to further this project.		
Constraints		
Due to Time constraints, the scope of this project would be reduced solely to meet this academic endeavour. The research shall continue beyond.		
Preliminary risks		
If permission and access to the required information is hindredd in any way during the research period, that might impact the delivery time and subsequent quality of the project.		
Budget		
The cost of this project has not yet been ascertained.		
Milestones and dates		
Milestone	Start date	1.5.11 End date
• Project Charter	1.5.12 August 22, 2016	1.5.13 August 28, 2016
• Introduction Chapter	1.5.14 August 29, 2016	1.5.15 September 4, 2016
• Theoretical Framework	1.5.16 September 5, 2016	1.5.17 September 11, 2016
• Methodological Framework	September 12, 2016	1.5.18 September 18, 2016
• Annexes, Executive Summary & Bibliograpy	September 19, 2016	1.5.19 September 25, 2016
•		

1.5.20 Relevant historical information

1.5.21 Prudy's Construction Services Limited(PCSL) is a small/ medium size construction company. It operated until 2013 as a small sub contracting unit, doing numerous small and large projects. In 2013, it formally established itself as a medium size Contraction Company(PCSL). While it has the experinece for over 20 years in construction, it had never taken on major works on it own until 2013. Currently its responsible for th econstruction of a 5 star multi million dollar Hotel in Saint Lucia. It faces the same challenges all other small companies face in terms of lack of structured Project management systems to develop as major companies.

Stakeholders	
Direct stakeholders: <ul style="list-style-type: none"> • 2 Directors of the Company 	
1.5.22 Indirect stakeholders: <ul style="list-style-type: none"> • Project Manager • Accountant • Office Manager • Procurement officer • Site Supervisors • Office Staff • Clients 	
1.5.23 External stakeholders: <ul style="list-style-type: none"> • Clients • Suppliers 	
Project Manager: Kofi Dovor	1.5.24 Signature:Kofi Dovor
Authorized by: Kofi Dovor	1.5.25 Signature: Kofi Dovor

Appendix 4: FGP WBS



Appendix 5: FGP Schedule

