Engineering Management
Field Project

Introducing a PMO In XYZ Company
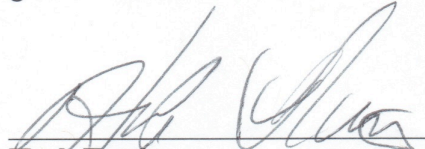
By

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Executive Summary

The purpose of this field project is to explore and build awareness about the main aspects—types, hierarchies, maturity models, and competency frameworks—related to establishing a Project Management Office (PMO) in a company. This study, inspired by a real case, examines a failed attempt to create a PMO in XYZ Company, which operates in the IT industry providing e-services. Through this analysis, the main elements needed for a successful PMO are identified and explained along with the steps needed to implement related theories. Furthermore, potential reasons for the failure of the initial PMO are investigated and recommendations for better alternatives are suggested. As a result, the lessons learned from this research can assist with making more informed decision when creating PMOs in the future.

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1. Introduction

There were efforts in XYZ Company to appropriately and successfully introduce a Project Management Office (PMO). There was already a Project Management team in place, and the company attempted several times to place the PMO unit under different departments such as the Software Development Department and the Strategic Business Development Department. Unfortunately, none of these attempts were successful, leading to the resignation of the unit manager and the removal of the PMO from the company.

XYZ Company can be categorized as an IT company that provides e-business services and solutions. In addition, it has successfully launched several e-Government services. XYZ Company aims to be the largest national system in secure e-business services. In the national market, it targets individuals and organizations from both public and private sector.

In general, it has been a subject of confusion to distinguish between PMO and Project Management. The absolute fact is that they have totally different roles. However, the debate has been about what relationship should be established between these two roles. Should project managers report to PMO? Or should PMO be a resource for project managers? Do they have to be within the same department? Or should PMO be independent, reporting directly to the CEO?

Introducing a PMO is neither a straightforward process, nor is it unified among different organizations. It is dependent on many factors, including the competence and commitment of project managers and resources within an organization (Kimmons). In addition, the project management maturity level of the

organization plays a very important role in defining how the PMO should be integrated, and what kind of roles and responsibilities should be defined between both the PMO and the Project Management Team.

2.   Literature Review

2.1.   PMO Definition

There are several definitions for a PMO. According to the fourth edition of Project Management Body of Knowledge PMBOK, "A Project Management Office (PMO) is an organizational body or entity assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. The responsibilities of a PMO can range from providing project management support functions to actually being responsible for the direct management of a project" (PMI, 2008). Another simple definition to a PMO is: "an organizational entity that has a role in ensuring that projects are completed successfully," (TenStep, Inc., 2002). Perry definition is: "In its simplest form, a PMO is an organization that vets projects for their value, monitors and provides oversight for approved projects, and assesses the effectiveness of the projects once completed and deployed. A mature PMO also monitors and reviews project documentation to ensure that it complies with agreed-to standards. It also provides project managers with resources such as standardized forms, templates, project plans, and expert guidance. Ideally, the PMO also serves as a roadblock remover, assisting the project manager in anyway practical to cut through red tape, resolve loggerheads, and other barriers."

2.2. PMO Types

The types of PMO fall into different categories. In return, there are different bases for this categorization, two of which are identified here. On one hand, there is a categorization based on the operational scope of the PMO (Al-Maghraby, 2011). On the other hand, PMOs can be categorized based on their influence, accountability, and the relationship between project managers and the PMO (TenStep, Inc., 2002).

Based on the operational scope, three variations can be defined: Single Project PMO, Portfolio Management Office, and Customer Based PMO (Al-Maghraby, 2011). Alternatively, other PMO types can be identified based on their influence, accountability, and the relationship between project managers and the PMO. For example, the project manager may directly report to the PMO, or the PMO would just provide support and guidance to the project managers who report to their functional unit (Al-Maghraby, 2011). Based on the potential different natures of relationship and authority between PMOs and project managers, the possible types of PMOs include project coordination, project management infrastructure, project management coaching, and project management resource center (TenStep, Inc., 2002).

Going through the PMO classification based on its operational scope, a *Single Project PMO* is one that is created and assigned to complete a single project. The lifetime of such a PMO is limited to the lifetime of the project. It starts at the beginning of the project, and it ends once the project is completed. A Single Project PMO is not really popular, and not the commonly used form as opposed to the others (Al-Maghraby, 2011).

When the operational scope of a PMO is in charge of all the projects in the organization, it is called a *Portfolio Management Office*. It is important to note that a Portfolio Management Office does not manage projects directly. Rather, its role is limited to project prioritization, resources selection, and continuous viability reviewing (Al-Maghraby, 2011).

The last operational scope categorization of a PMO is the *Customer Based PMO*. This kind of PMO is concerned with projects that are sponsored by a specific customer, whether that customer was internal or external (Al-Maghraby, 2011).

Moving to the PMO categorization based on their influence, accountability, and the relationship between project managers and the PMO, the first type is the *Project Coordination*. This is more like a data center for all projects in the organization. It works on an ongoing basis to collect information about every project in the organization, including its status, budget, issues, and all other details about the project. This PMO would then use the collected information to generate periodic reports for top management. To make this more feasible, the PMO can standardize the format and frequency of collecting data; using predefined and agreed on forms and metrics (TenStep, Inc., 2002).

As for authority, *Project Coordination* has no direct authority over project managers. It should follow up with them to collect the needed information, and if any power is needed to do so, then escalation to management is the only way to go (TenStep, Inc., 2002).

The reason this kind of PMO may be valuable for large organizations with many projects, is that central point of authority is hard to enforce. Therefore, a central point for gathering information is more feasible and effective.

Project Management Infrastructure is another kind of PMO. In addition to what *Project Coordination* has, a *Project Management Infrastructure* has an additional role in how projects are executed. This involves defining and implementing the organization's project management standards, guidelines, forms, and processes, insuring consistency in how project managers deliver their projects using the tools and techniques that increase success rate. However, unlike *Project Coordination*, project communication and coordination is an optional role for *Project Management Infrastructure* based on the organization it operates within. The two main benefits out of this kind of PMO are: (1) Having unified standards and process for all projects across the organization, (2) Providing project managers with needed templates and guidelines readily available to use. The enforcement technique that *Project Management Infrastructure* can employ is to have a part of the performance evaluation be about how well the defined project management standards and processes were followed by project managers—or their managers—in delivering their projects (TenStep, Inc., 2002).

The main difference between this and *Project Coordination* is that *Project Coordination* is more about standardizing the "what" project information, while *Project Management Infrastructure* standardize the "what" project information and "how" they are done. Therefore, a *Project Management Infrastructure* has more authority than *Project Coordination*.

The third PMO kind is *Project Management Coaching*. In addition to the roles of a *Project Management Infrastructure*, this kind of PMO makes their members more closely and actively involved with project managers by coaching them to use the defined project management processes, tools and techniques of the organization. Hence, such PMO is responsible for developing the project management infrastructure of the organization, coaching project managers, and providing ad-hoc support to them as needed. A key factor for the success of such PMO is to include members equipped with strong project management skills and experience that enables them to provide the required level of coaching and support to other project managers (TenStep, Inc., 2002).

The last and most traditional type of PMO is the *Project Management Resource Center*. This is where the PMO has the strongest authority over project managers, placed as their functional department. Here, project managers report to the PMO manager. In addition, the project sponsor will share some authority that is limited to their project and the project managers assigned to them. The *Project Management Resource Center* could also share the responsibilities of the PMO types explained earlier (TenStep, Inc., 2002).

2.3. PMO Hierarchy

While explaining the PMO types might give a good explanation and understanding of them in an organizational context, a hierarchical explanation is needed to determine where they exactly operate within the organizational hierarchy.

Having different kinds of PMO produces different hierarchies of where they could exist within the organizational structure. Before diving into the specific details

of potential PMO hierarchy, there should be a higher level of understanding of how different PMOs can be hierarchically located within an organization. Generally, a PMO could be a strategic one that is centrally located in the organization, serving all units and departments. Another hierarchy of a PMO is having it in a central strategic or enterprise level. However, instead of directly serving all organizational units and departments, it would have a sub-PMO for the units and departments it is intended to serve. Other than that, one or more PMOs can be established independently from each other within specific functional organizational unit. Their operational and influence scope is limited to the functional unit they're in, and they report to the head of that unit (Al-Maghraby, 2011).

According to the PMBOK, starting with the weakest form of project management organizational structure to the strongest, hierarchical organization can be functional, weak matrix, balanced matrix, strong matrix or projectized. Moreover, an organizational PMO context can end up evolving by having a mix and match between the different PMO hierarchies mentioned earlier. This is referred to as organizational PMO or composite organization. Appendix A provides a demonstration of all these organizational hierarchies (Perry, 2009; PMI, 2008).

Comparing the authority differences between project managers, and functional managers among these organizational structures, one might have higher authority than the other. In some situations, they could share the same level of authority. On one hand, Project managers would have the highest authority in a projectized organization and the lowest in functional organization. Functional managers, on the other hand, would have the highest authority in a functional organization, and the

lowest in a projectized organization. A balanced matrix organization is where levels of authority are roughly equal. The following figure demonstrates the authority variance between project managers and functional managers in the explained hierarchies above (PMI, 2008):
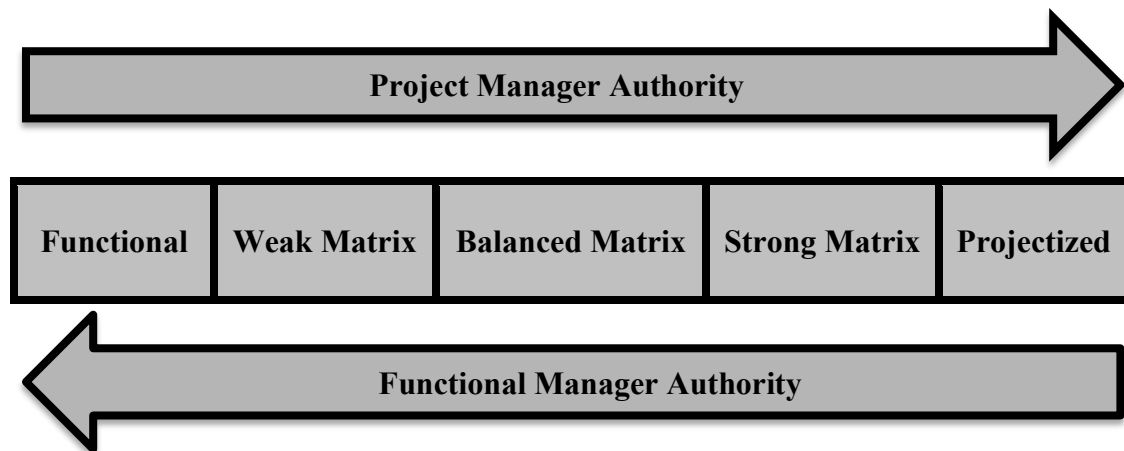

Project Manager Authority

| Functional | Weak Matrix | Balanced Matrix | Strong Matrix | Projectized |

Functional Manager Authority

Figure 1: Authority Levels in the Different Organizational Structures. (PMI, 2008)

The following table provides a more detailed elaboration on the project manager's authority and influence in the different organizational structures.

Table 1: Organizational Influences on Projects

Organization Structure / Project Characteristics	Functional	Matrix			Projectized
		Weak	**Balanced**	**Strong**	
Project Manager's Authority	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Project Budget Control	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

Source: A Guide to the Project Management Body of Knowledge. (PMI, 2008)

2.4. Project Management Maturity (PMM)

2.4.1. Definition

One of the key organizational aspects that can be evaluated and improved to accomplish better project management is the Project Management Maturity (PMM). An organization can advance its project management capabilities and performance by addressing and enhancing its PMM. In her research, Pasian included the following perspectives about PMM (Pasian, 2011):

- *"Maturity in project management is the development of systems and processes that are repetitive in nature and provide a high probability that each project will be a success." (Kerzner, H. 2004)*

- *"Project management maturity is the sophistication level of an organization's current project management practices and processes." (Ibbs, Reginato & Kwak 2004)*

- *"In the real world, we will not find the fully matured organization; no one has reached the stage of maximum development and no one will." (Andersen & Jessen 2003)*

What we can obtain from these perspectives is that the more effective and efficient project management practices, processes, policies, and procedures are, the higher the PMM is. On the other hand, Andersen and Jessen's perspective indicates that perfection in PMM can never be reached. Other than these perspectives, Pasian provided the following PMM definitions (Pasian, 2011):

- *"The technical meaning associated with capability maturity models that positions 'project management maturity' as the extent to which an organizational project management capability has explicitly and consistently deployed processes that are documented, measured, controlled and continually improved." (Cooke-Davies 2004)*

- *"Project management maturity is the organizational receptivity to project management." (Saures 1998)*

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- *"Maturity is best explained as the sum of action (ability to act and decide), attitude (willingness to be involved), and knowledge (an understanding of the impact of willingness and action)." (Andersen and Jessen 2003)*

For organizations to improve their PMM, they need to follow certain guidelines or methodologies in order to achieve their goals in project management excellence. Such guidelines and methodologies have been developed in what is known as PMM models. PMM models are defined as "a framework describing the ideal progression toward desired improvement using several successive stages or levels (Man, 2007)." There are several PMM models that are given and explained in the following subsection.

2.4.2. Project Management Maturity Models (PMM Models)

There are numerous PMM models that have evolved over the years, coming from different schools, industries, and institutions. Each model has its unique characteristics, designed to serve the best interest of the people who developed them, their organizations, and their industries. However, they all have a common goal: to improve the project management practices in their working context. The following table provides a list of some existing PMM models (Man, 2007):

Table 2: Existing PMM Models

No.	Acronym	Name	Owner
1	OPM3	Organizational Project Management Maturity Model	Project Management Institute (PMI)
2	P3M3	Portfolio, Programme, Project Management Maturity Model	Office of Government Commerce (OGC)
3	P2M	Project & Program Management for Enterprise Innovation (P2M)	Project Management Association of Japan (PMAJ)
4	PMMM	Project Management Maturity Model	PM Solutions
5	PPMMM	Project Portfolio Management Maturity Model	PM Solutions
6	PMMM	Programme Management Maturity Model	Programme Management Group
7	PMMM	Project Management Maturity Model	KLR Consulting

No.	Acronym	Name	Owner
8	(PM)^2	The Berkeley Project Management Process Maturity Model	Department of Civil Engineering University of California at Berkeley
9	ProMMM	Project Management Maturity Model	Project Management Professional Solutions Limited
10	MINCE2	Maturity Increments IN Controlled Environments	MINCE2 Foundation
11	PPMM	Project and Portfolio Management Maturity	PriceWaterhouseCoopers (PWC) Belgium
12	CMMI	Capability Maturity Model Integration	Software Engineering Institute (SEI)
13	SPICE	Software Process Improvement and Capability Determination	Software Quality Institute Griffith University, Australia
14	FAA-iCMM	Federal Aviation Administration - Integrated Capability Maturity Model	US Federal Aviation Administration
15	Trillium	Trillium	Bell Canada
16	EFQM	EFQM Excellence Model	European Foundation for Quality Management (EFQM)
17	COBIT	Control Objectives for Information and related Technology	Information Systems Audit and Control Association (ISACA)
18	INK	INK Management model	Instituut Nederlandse Kwaliteit (INK)
19	ProjectProof	VA Volwassenheidsmodel	Van Aetsveld
20	PAM	Project Activity Model	Artemis
21	Project Excellence Model	The Project Excellence Model	Berenschot
22	PMMM	Project Management Maturity Model	International Institute for Learning (IIL) H. Kerzner

Source: A framework for the comparison of Maturity Models for Project-based Management. (Man, 2007)

In this paper we will only review few of these PMM models, including OPM3, (PM)^2, and CMMI. These were selected based on the popularity perceived from literature, resources accessibility, and/or their relevance to the software development and information technology industries.

2.4.2.1. (PM)^2

Project Management Process Maturity (PM)^2 Model was developed by Young Hoon Kwak, Ph.D. and C. William Ibbs, Ph.D., also known as Berkeley PM Maturity Model. It was developed to be used as a benchmark tool for organizations to compare their own characteristics and the different levels of maturity defined within (PM)^2.

There are five maturity levels defined under (PM)^2, which start with Ad-hoc, Planned, Managed, Integrated, and Sustained. Kwak and Ibbs states that the model "evolves from functionally-driven organizations to project-driven organizations." These five stages are illustrated in the figure below (Kwak & Ibbs, 2002).
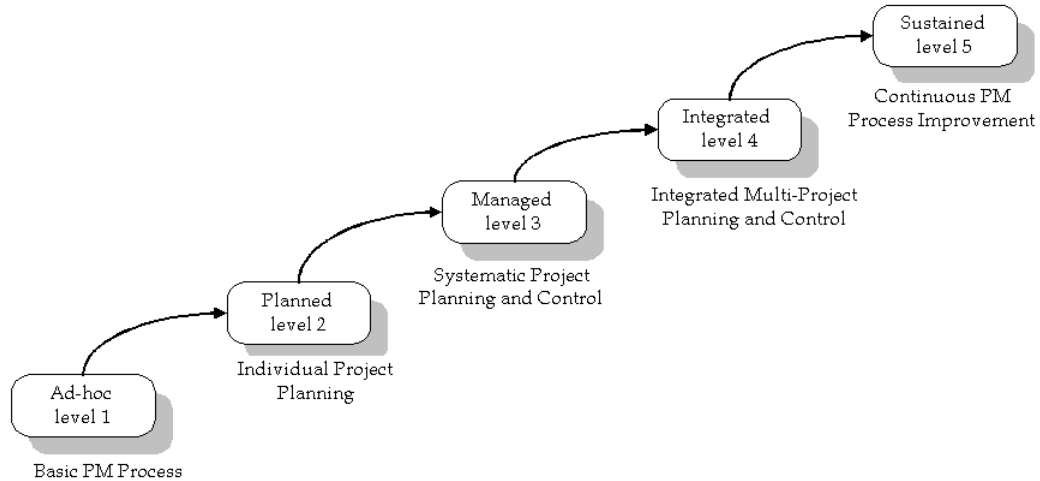

Figure 2: Five Level Project Management Process Maturity (PM)^2 Model. (Kwak & Ibbs, 2002)

Comprehensive characteristics are defined for the five maturity levels in (PM)^2. These characteristics serve as a reference point or yardstick. For each maturity level, the following three tables provides the key project management processes, major organizational characteristics, and key focus areas (Kwak & Ibbs, 2002):

Table 3: Key Project Management (PM) Processes of (PM)^2 Model

Maturity Level	Key PM Processes
Level 5	▪ PM processes are continuously improved ▪ PM processes are fully understood ▪ PM data are optimized and sustained
Level 4	▪ Multiple PM (program management) ▪ PM data and processes are integrated ▪ PM processes data are quantitatively analyzed, measured, and stored
Level 3	▪ Formal project planning and control systems are managed ▪ Formal PM data are managed

Maturity Level	Key PM Processes
Level 2	▪ Informal PM processes are defined
	▪ Informal PM problems are identified
	▪ Informal PM data are collected
Level 1	▪ No PM processes or practices are consistently available
	▪ No PM data are consistently collected or analyzed

Source: Project Management Process Maturity (PM)[2] Model. (Kwak & Ibbs, 2002)

Table 4: Major Organizational Characteristics of (PM)[2] Model

Maturity Level	Major Organizational Characteristics
Level 5	▪ Project-driven organization
	▪ Dynamic, energetic, and fluid organization
	▪ Continuous improvement of PM processes and practices
Level 4	▪ Strong teamwork
	▪ Formal PM training for project team
Level 3	▪ Team oriented (medium)
	▪ Informal training of PM skills and practices
Level 2	▪ Team oriented (weak)
	▪ Organizations possess strengths in doing similar work
Level 1	▪ Functionally isolated
	▪ Lack of senior management support
	▪ Project success depends on individual efforts

Source: Project Management Process Maturity (PM)[2] Model. (Kwak & Ibbs, 2002)

Table 5: Key Focus Areas of (PM)[2] Model

Maturity Level	Key Focus Areas
Level 5	▪ Innovative ideas to improve PM processes and practices
Level 4	▪ Planning and controlling multiple projects in a professional matter
Level 3	▪ Systematic and structured project planning and control for individual project
Level 2	▪ Individual project planning
Level 1	▪ Understand and establish basic PM processes

Source: Project Management Process Maturity (PM)[2] Model. (Kwak & Ibbs, 2002)

The $(PM)^2$ model goes even beyond the characteristics given in the above tables. It has more focused characteristics based on the nine project management knowledge areas defined by PMI in the 4th edition of the PMBOK guide. These knowledge areas are Project Integration Management, Project Scope Management,

Project Time Management, Project Cost Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, and Project Procurement Management.

2.4.2.2. OPM3

OPM3 stands for Organizational Project Management Maturity Model. It was developed by the Project Management Institute (PMI). One of the unique characteristics about OPM3 is that not only does it cover the domain of project management, but it also includes program management and portfolio management domains. Three essential elements are covered by OPM3, including Knowledge, Assessment, and Improvement. The knowledge element provides theoretical awareness about organizational project management, its maturity, and related best practices in those areas. It generally provides answers to "what" kinds of questions. The assessment element provides the tools needed to perform PMM assessment of an organization. In other words, this element helps in identifying the current state of an organization. The third element, improvement, helps organizations know how to plan on moving from their current state to a better level, where the overall PMM of the organization can be improved. Thus, an organization would know where it should be in the short or long term, and how it can get there. The given figure below demonstrates these three elements (PMI, 2004):

Figure 3: The Three Elements of OPM3. (PMI, 2004)

The stages PMI provides to go through the OPM3 elements are continuous and cyclical five steps, starting with preparing for assessment, performing assessment, planning for improvements, implementing improvements, and finally repeating the process. The cycle would go back again to performing assessment and so forth. The following figure illustrates the relationship between these steps and under which OPM3 element they reside (PMI, 2004):
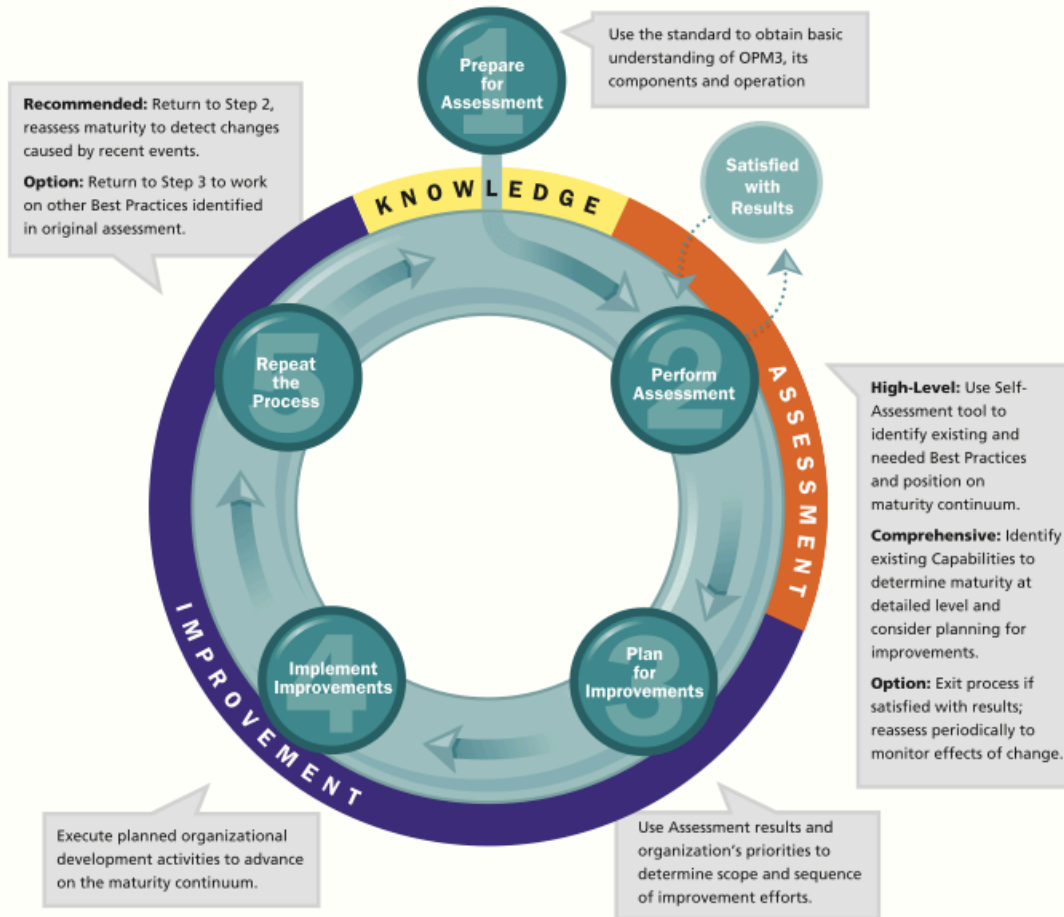
Figure 4: Steps to Implementing OMP3. (PMI, 2004)

Using the above continuous improvement cycle, OPM3 provides four levels of maturity: Standardization, Measurement, Control, and Continuous Improvement (Man, 2007). The OPM3 process applies these levels on the three domains mentioned earlier, including project, program, and portfolio management. To build an understanding of how OPM3 relates the different maturity levels with the three domains, the image given below is a starting point that demonstrates the five project management process groups (PMI, 2003):

Figure 5: Project Management Process Groups. (PMI, 2003)
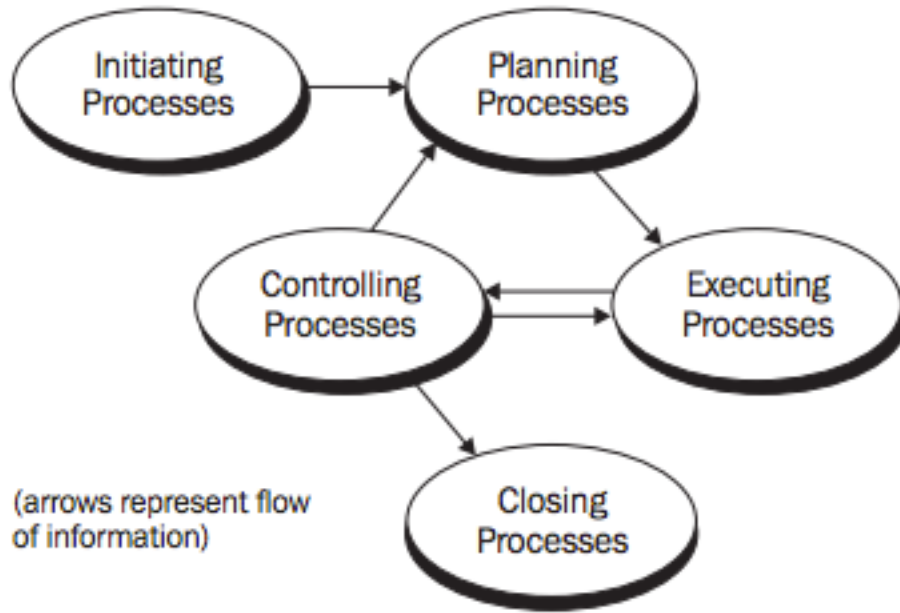
The project management process groups apply similarly on program management and portfolio management. The way these process groups work together when an organization has all domains of project, program, and portfolio management, is illustrated in the image below:
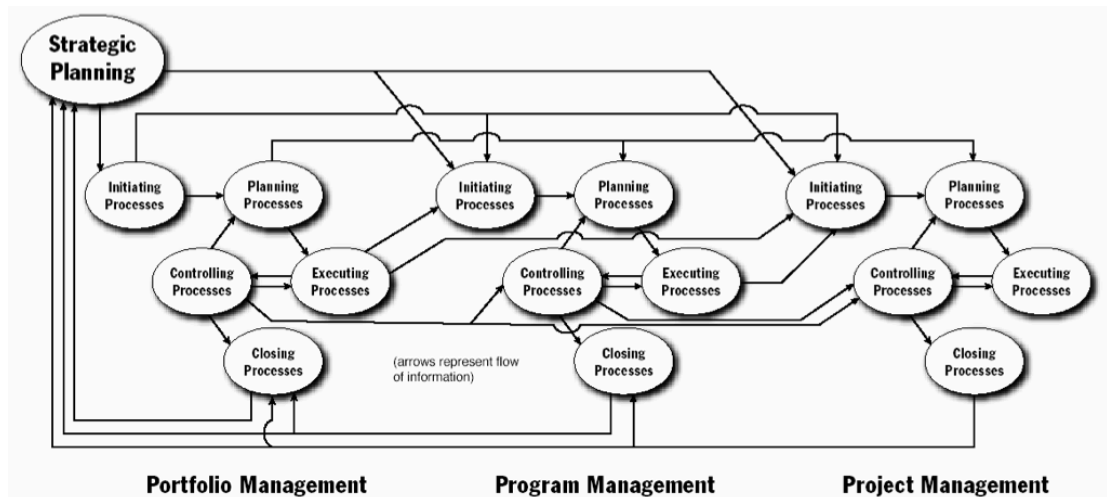

Figure 6: Project Management Process Groups in Project, Program, and Portfolio Management. (PMI, 2003)

OPM3 combines the process groups' activities for the domains of project, program, and portfolio management along with the OPM3 maturity levels, producing a multidimensional process that is referred to as OPM3 Process Construct. The OPM3 Process Construct is shown in the figure below (PMI, 2003):
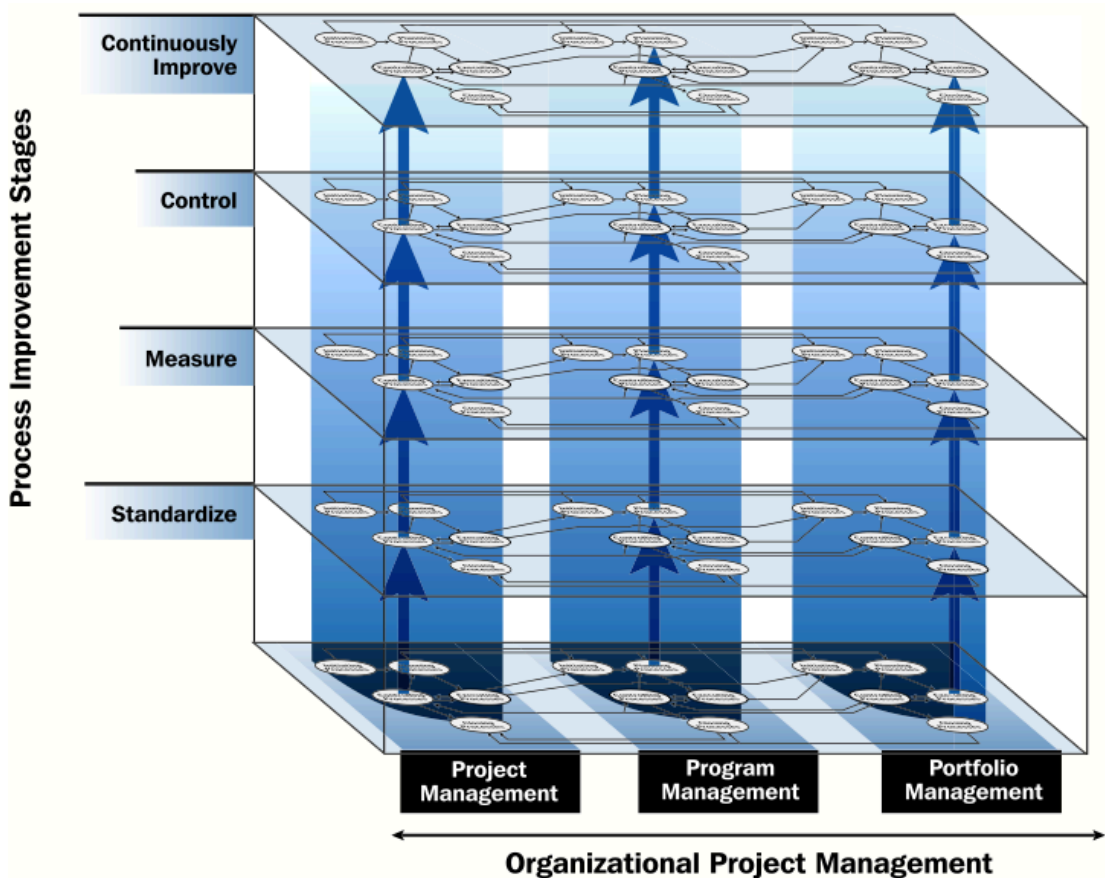
Figure 7: OPM3 Process Construct. (PMI, 2003)

Since OPM3 originated from PMI, it does not target a specific industry, nor is it considered biased to any of them. Therefore, it is suitable for multiple industries. Moreover, while most maturity models have a set of defined stages, where organizations are expected to follow unique methodologies in order to promote maturity from one level to other, OPM3 suggests a continuous method that is repeated every time to improve PMM (Pasian, 2011).

2.4.2.3. CMMI

CMMI is the abbreviation of Capability Maturity Model Integration. It was developed by Software Engineering Institute (SEI). This model originally came from a Capability Maturity Model for Software (CMM) that was introduced in 1993. Over the years, CMM improved and evolved through several stages into a more advanced and comprehensive model. SEI eventually came up with CMMI v1.3 in 2010. CMMI v1.3 was actually divided into three different models which target specific industries or business models. The three CMMI v1.3 models are CMMI for Acquisition, CMMI for Development, and CMMI for Services (SEI, 2010). Overall, The CMMI is reported as a continuous improvement and quality management methodology, along with Malcolm Baldrige, OPM3, Six Sigma, Lean Six Sigma, and Quality Function Deployment methodologies (PMI, 2008).

CMMI for Acquisition is designed for organizations that mainly work with suppliers in order to provide services or make products. CMMI for Development is for organizations whose core business is to develop products or services. CMMI for Services is for organizations that are all about providing services. One or more of these three models can apply to a business. In addition, a business may choose to mix and match between these models and different divisions operating within it. It all depends on the main goals and objectives of the business or division, and how it aligns with the value propositions given by these models (Phillips & Shrum, 2011).

The CMMI model is generally composed of several elements: Maturity/Capability Levels, Process Areas, Goals (Generic and Specific), and Practices (Generic and Specific). They way these elements are structured and related

to each other is dependent on what CMMI defines as Representation. A CMMI Representation is the highest level to look at the whole CMMI model. There are two Representations, Staged and Continuous. Both representations use the same elements of Process Areas, Goals (Generic and Specific), and Practices (Generic and Specific). However, as a benchmarking tool, Staged representation uses five Maturity levels, while Continuous representation uses four Capability levels. These levels are given in the following table (SEI, 2010).

Table 6: Comparison of Capability and Maturity Levels

Level	Continuous Representation Capability Levels	Staged Representation Maturity Levels
Level 0	Incomplete	
Level 1	Performed	Initial
Level 2	Managed	Managed
Level 3	Defined	Defined
Level 4		Quantitatively Managed
Level 5		Optimizing

Source: CMMI® for Development, Version 1.3. (SEI, 2010)

The focus of the Staged representation is on the overall maturity of an organization, or the maturity of a group or set of process areas. Continuous representation, on the other hand, targets an individual process area and its capability using the four levels in the above table. However, while these representations work differently, they actually use the same essential elements and their hierarchy, including process areas, goals, and practices. The figure below demonstrates the difference in the emphasis of Staged and Continuous representations (SEI, 2010):

Continuous Representation
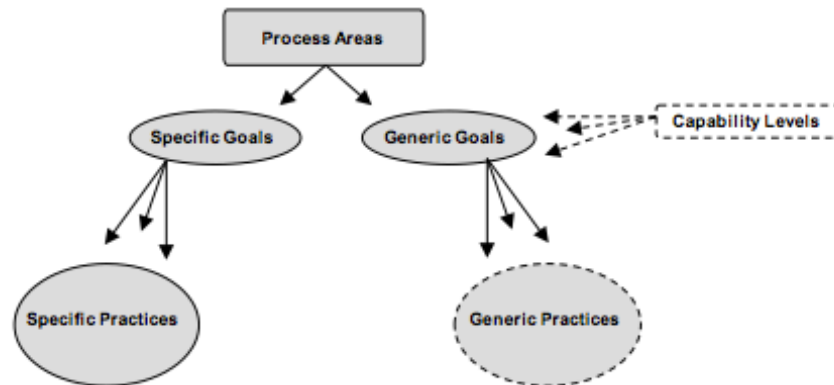
Staged Representation
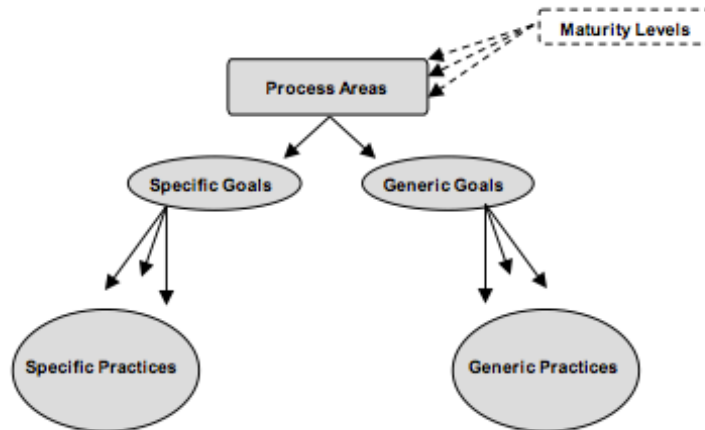
Figure 8: Structure of the Continuous and Staged Representations. (SEI, 2010)

There are clearly defined characteristics for each capability and maturity level. Starting with capability levels, Incomplete (level 0) process is one that partially exists, or doesn't exist at all. It is missing one or more specific goals, and is without any generic goals. Performed (level 1) process achieves the work expected from it, along with the related specific goals. However, the performance is not guaranteed to

sustain over time. Managed (level 2) process is a performed process that is set to survive stressful conditions. It would have skilled employees and sufficient resources and is in compliance with a policy in the planning and execution of it. It is evaluated to assure it adheres to the related process description by monitoring, controlling, and reviewing it. Defined (level 3) process goes beyond the managed level in not only complying with a set of standards and policies, but also allowing those standards and policies have to become organizational and commonly adapted by every other process in the organization (SEI, 2010).

Moving to the five Maturity levels, it starts with Initial (level 1) processes. This level relies on people and their skills and ad-hoc processes. In addition, performance is not consistent, especially in the times of crisis. Managed (level 2) and Defined (level 3) are similar to the Managed (level 2) and Defined (level 3) explained under Capability levels above. However, under Maturity levels, the characteristics are applied on all or a set of process subject to this CMMI improvement model. Processes become Quantitatively Managed (level 4) when they are subject to quantitative analysis that measures quality and performance. The standards set on these quality and performance measures revolve around customers, end users, organization and process implementers needs. The ultimate maturity level in the CMMI model is Optimizing (level 5). It is when processes have consistent standards and policies that are being evaluated and measured against business objectives, and then a plan is put in place to continuously and incrementally improve that obtained quantitative quality and performance measures (SEI, 2010).

2.5.   Project Manager Competency

While PMM models emphasize the advancement of organizations and their processes, policies, and standards in general; there is a need to complement such models with methodologies to advance the people and their competency levels. Therefore, a project manager competency advancement methodology is needed. Before getting into potential approaches for developing the competency of project managers, it is important to understand the meaning of a project manager competency. PMI defines competence under project management as "the demonstrated ability to perform activities within a project environment that lead to expected outcomes based on defined and accepted standards."

Over the years, several competency models have been developed. Some of them are industry or discipline specific, while others are generic and could work with any industry or discipline. The focus here will be on competency frameworks for project management discipline. One examples of such framework is Project Manager Competency Development (PMCD) Framework. The following subsection will dive into the PMCD framework.

2.5.1.   PMCD Framework

The Project Manager Competency Development (PMCD) Framework is one of global standards developed by PMI (PMI, 2008). It defines three high-level competency dimensions: Knowledge, Performance, and Personal. For these dimensions, PMI provides the following definitions (PMI, 2007):

- *Project Manager Knowledge Competence—What the project manager knows about the application of processes, tools, and techniques for project activities.*

- *Project Manager Performance Competence—How the project manager applies project management knowledge to meet the project requirements.*
- *Project Manager Personal Competence—How the project manager behaves when performing activities within the project environment; their attitudes, and core personality characteristics.*

The assessment or demonstration of these three competences differs from one to the other. PMP certification or other similar and recognized exams are good tools to validate project manager knowledge competence. Evaluating the actions and outcomes related to project management activities can help with the assessment of project manager performance competence. Project manager personal competence is all about the behavioral aspects of project managers. The following figure demonstrates the three dimensions and how the actual competence levels can be illustrated against perfect measures (PMI, 2007):
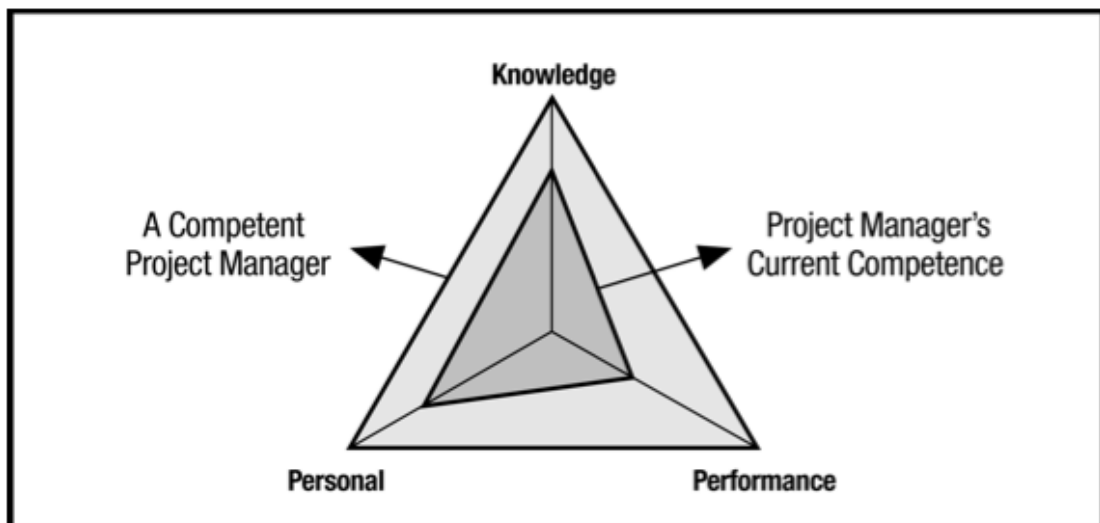

Figure 9: PMCD Framework dimensions of competence. (PMI, 2007)

The PMCD framework provides a comprehensive coverage to the knowledge, personal, and performance dimensions that are consistent with the PMBOK guide.

However, to some industries and organizations this may not be enough. There are some industry specific competencies and/or organizational specific competencies. They differ from one industry to another and from one organization to another. Such competencies are impossible to have under a single competency development framework, including the PMCD framework. Yet, the PMCD framework does have that into consideration. PMCD framework suggests that two more dimensions, industry specific and organizational dimensions, can be added to complement the original three dimensions. The following figure is an illustration of how the PMCD framework would look like with these two dimensions included (PMI, 2007):
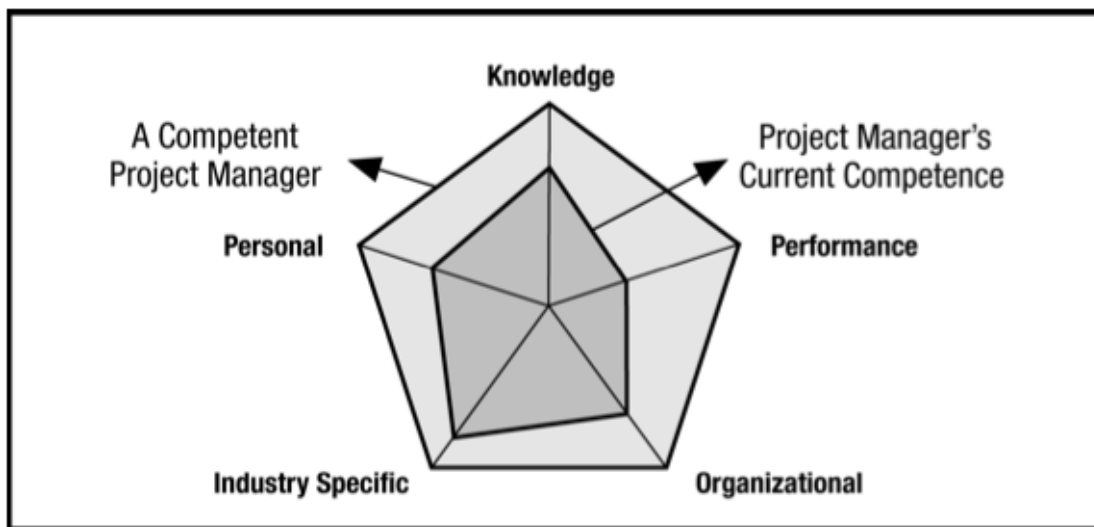
Figure 10: Complementing the PMCD Framework. (PMI, 2007)

The PMCD framework provides a different structure for the competence dimensions than what the previous figure may suggest. The three essential dimensions might seem to be separate. However, the assessment structure has the personal and performance competences separate, while the knowledge competence would be the combination of both personal and performance competences. Then, the

PMCD framework divides each of the personal and performance competences into *units*. Each of these *units* is broken down into *elements* that represent the main activities under that unit, which project managers are expected to demonstrate their competence in. The following figure provides a good illustration of the personal and performance units, and how together they compose the knowledge competence (PMI, 2007).

Knowledge Competence

Performance Competence

- Initiating a Project
- Planning a Project
- Executing a Project
- Monitoring and Controling a Project
- Closing a Project

Personal Competence

- Communicating
- Leading
- Managing
- Cognitive Ability
- Effectiveness
- Professionalism

Figure 11: PMCD Framework graphical overview. (PMI, 2007)

The structure of the PMCD framework breaks down further into having *Performance Criteria* and *Types of Evidence* for each *element* under each *unit*. The performance criteria is a description of what a project manager needs to perform or obtain in order to fulfill their competence against an element. Types of evidence are the deliverables that can validate the performance criteria. Below is an example of a single competence element and its performance criteria and types of evidence (PMI, 2007):
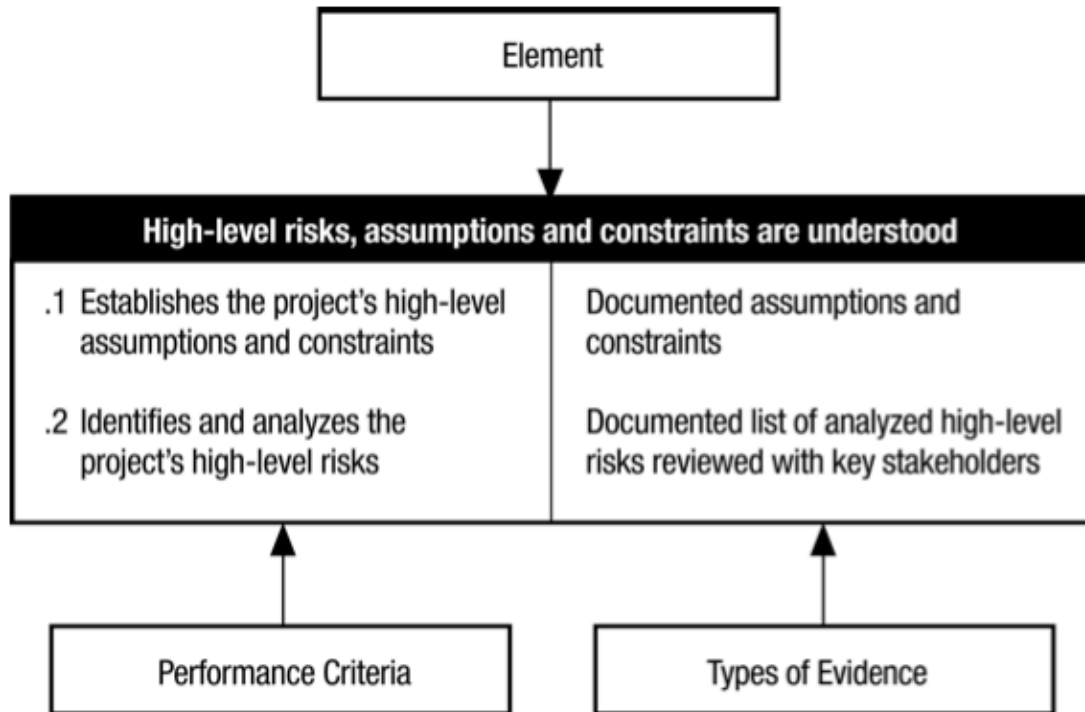
Figure 12: Example of part of a Performance Competence Element. (PMI, 2007)

The PMCD framework does not provide a specific structure for the industry specific or the organizational dimensions. Nonetheless, it expects from organizations adopting the PMCD framework to develop their own units, elements, performance criteria, and types of evidence for these two dimensions and follow the same processes given for the essential dimensions.

In the assessment processes, PMI suggests three iterative steps to follow in the process of making the assessment. These steps are Assessment of Performance, Preparation of Competence Development Plan, and Implementation of Project Manager Competence Development Plan. The first step is more about knowing the current state against each of the defined competencies. The scale recommended by the PMCD framework consists of three levels; below expectations or developing

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competence, meets expectations or is competent, and exceeds expectations or highly competent.

Based on the results of the first step, the next step is to prepare competence development plan. In this step, areas of weaknesses or potential improvements will be identified and listed. The list will then be prioritized based on the competence importance for the project manager and the needs of the organizations. Consequently, an action timed plan will be created according to the identified importance and priorities. The plan should provide the project manager with the steps and deadlines to develop and deliver the proof of competences subject to improvement. The plan would also include how the progress is monitored.

The final step is to implement the competence development plan. Project managers are expected to complete the planned activities defined in the second step. In addition, there should be a defined and measurable method to monitor the progress of the plan and competence development in general. Furthermore, motivating project managers and providing them with the support they need would increase the success of implementing competence development plan. In the implementation, the given plan should be evaluated on how successfully it helped the project manager in developing the competences subject to improvement, and what possible enhancements could be made.

Taking these steps into consideration, there is also what PMI identifies as *Assessment Rigor*, which is defined as "the level of thoroughness, intensity, breadth, and depth for the assessment of the project manager's competence." The reason behind identifying such concept is that the PMCD framework targets a large number

of audience, including individuals, organizations adopting the framework, and organizations providing the assessment as a service. For these different users, the suitable rigor level is different. Three levels of rigor are *low*, *medium*, and *high*. *Low rigor* is an informal self-assessment approach of the performance criteria. *Medium rigor* is more comprehensive and formal, performed by supervisors or peers through interviews or forms to be filled out by both the evaluator and evaluated project manager. *High rigor* is a formal and carefully documented assessment that is proven consistent and successful; therefore, it is accepted as a reliable assessment to be used repeatedly (PMI, 2007).

2.6. Establishing a PMO

To put it all together, there has to be a set of steps to follow in order to establish a PMO in an effective manner. It is important to note, however, there is no such thing as *the right* PMO, or that a specific PMO model is wrong (TenStep, Inc., 2002). In addition, several different sets of steps are suggested in the literature about how to establish a PMO. Still, these different approaches have steps in common, such as creating a vision or identifying the purpose and goals of the PMO that goes hand in hand with the organization's vision and strategy (Al-Maghraby, 2011; Instantis, Inc., 2011; Perry, 2009; TenStep, Inc., 2002). For the purposes of this project, Instantis's approach will be considered and explained. According to Instantis, "PMO development roadmap" has three main steps: plan, implement, and manage. Each of these steps breaks down into further key steps and milestones as shown in the figure below (Instantis, Inc., 2011):
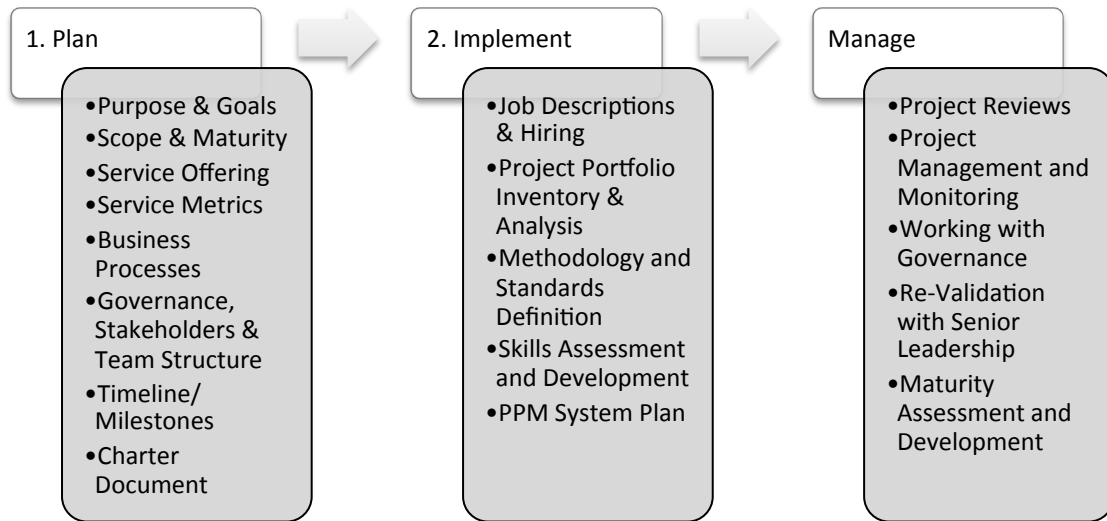
1. Plan	2. Implement	Manage
•Purpose & Goals •Scope & Maturity •Service Offering •Service Metrics •Business Processes •Governance, Stakeholders & Team Structure •Timeline/ Milestones •Charter Document	•Job Descriptions & Hiring •Project Portfolio Inventory & Analysis •Methodology and Standards Definition •Skills Assessment and Development •PPM System Plan	•Project Reviews •Project Management and Monitoring •Working with Governance •Re-Validation with Senior Leadership •Maturity Assessment and Development

Figure 13: Instantis's PMO Development Roadmap. (Instantis, Inc., 2011)

Instantis's plan step seeks the answers of "*why, what, how, who and when*" questions about the PMO. The answers to these questions will create the building blocks in generating a complete and successful PMO. The following table lists these key components and related questions (Instantis, Inc., 2011).

Table 7: Instantis Key Plan Components and Questions

	Key Plan Components	**Key Questions Answered**
Why?	1. Purpose & Goals	• What is the PMO's fundamental purpose and goals?
What?	2. Scope & Maturity 3. Service Offering 4. Service Metrics	• What is the scope of the PMO based on organization needs and target organizational maturity? • What core services will the PMO provide and how will success/value be measured?
How?	5. Business Processes	• How will services be managed and delivered?
Who?	6. Governance, Stakeholders & Team Structure	• Who does the PMO report to? • Who are the PMO's customers and stakeholders? • Who comprises the PMO team (key roles, org chart)?
When?	7. Timeline/Milestones	• When will the PMO be in business and when will the core services come online?

	Key Plan Components	Key Questions Answered
Summary	8. Charter	• A simple one page summary document answering most/all of the above

The second phase after planning is implementation. This phase starts with creating key roles and job descriptions. Such roles and positions could include the PMO Director, PM Manager, Professional Development Manager, and PMO Analyst. Second, project data should be gathered and an analysis should be conducted; i.e., the PMO should collect the essential information about each project. Such information includes project name, description, scope, type, resources, priority, progress, deadlines, etc. Third, the PMO should define the methodologies and standards to be adopted as part of the project management and related processes, policies, and procedures. Fourth, an organizational project management assessment and development plan should be created. This is what the PMCD framework is all about. Such framework or other frameworks can be used to accomplish this step. The framework to be chosen should be based on overall organizational needs, and probably the selected methodologies and standards in the third step. The last step in the implementation phase is to create a plan with the required Project Portfolio Management systems that are needed to serve the PMO needs and goals. The potential systems vary from being simple to complex; cheap to expensive; or owned to licensed or hosted solutions (Instantis, Inc., 2011).

Managing the PMO is the third and final phase in the Instantis's development roadmap. The first step in this phase is to conduct project reviews. This involves making sure projects are in good standing in regards of progress, plans,

documentations, resources, communication, and all other potential components of projects. Second, a project monitoring and management model should be created with processes that facilitate maintaining and controlling projects' status, issues, risks, costs, resources, quality, time, and change. Third, a PMO should maintain the governance that was created in the planning phase. The purpose of this step is to support an efficient and effective performance for the PMO on the long run. Some activities related to governance are retaining, killing, consolidating, and reprioritizing projects. Fourth, a PMO should consistently work with senior leadership to make sure they are meeting the anticipated goals, generating the expected value, producing the required reports, and so on. This is to guarantee that the PMO is always on the right track and is aligned with the organizational strategy and direction. The last step in the managing phase is to work on taking the PMO maturity to the next level. According to the Instantis method, the PMO current and target maturity level has already been decided in the planning phase. In the managing phase, the PMO carries out what is needed to increase its maturity according to the PMM model chosen to fit the specific organizational needs (Instantis, Inc., 2011).

3.   Procedure and Methodology

3.1.   Company Overview

XYZ Company is specialized in providing e-services—mostly e-government services—which target citizens, residents, private sector, and government agencies. It is considered a midsize company with 200-300 employees. The company had been established for five years when the problem, which is the subject of this study, occurred.

The strategic intention of the company is to become the leader in the e-government services market. It is supported by strategic relationships with national databases. Such a relationship facilitates many of the initiatives to materialize and generate benefits that all stakeholders appreciate. Not only that, but the company also intends to strategically promote its project management capabilities. This will help the company be stronger in the projects developed internally, and also become a project management service provider to external organizations with projects dependent on national databases.

The functional units of the company are Sales, Marketing, Finance & Human Resources, Operations, Strategic & Business Development, Software Development, and Research & Development. Other customer-based units exist, such as those responsible for a specific customer or project. While each department has its unique structure, the frontline actors of each one of them is provided in the following table:

Table 8: The Company Functional Units and their Respective Frontline and Other Positions

Functional Unit	Frontline Position	Other Positions
Sales	Account Manager	
Marketing	Brand Manager	Public Relations Manager, Designer
Finance & Human Resources	Accountant, Recruitment Officer	HR Administrator, HR Specialist, Legal Officer, Training Manager
Operations	Service Manager	Change Manager, Customer Support, Technical Support, Systems Administrator
Strategic & Business Dev.	Product Manager	Business Developer
Software Development	Project Manager	Program Manager, Software Architect, Solutions Developer, Database Administrator, Quality Engineers,

		Systems Analyst
Research & Development	Researcher	
Customer-based units	Unit Manager	

For a better understanding of how these units are organized and the relationship between their respective positions, an organizational structure is given in Appendix B-1. It demonstrates the relationship between these positions and their functional units.

The given organizational structure suggests two different kinds of projects. There are projects developed internally through the Software Development Department. They represent the greater percentage of projects of the company. On the other hand, there are external projects that are outsourced. In other words, these projects are managed by the company and developed through external companies. The customer-based units shown in the organizational structure are responsible for managing these projects.

The Software Development Department has four subunits. These subunits are Project Management, Software Solutions, Database, and Quality Assurance, with a manager for each subunit. A project team would have one or more members from each of these units, with project managers leading the project team they're in. Setting the focus on project managers and their relationship with the resources assigned to the projects, we find that the project managers and other project team member stand on the same administrative level. Project members report to their functional subunit manager, and the functional subunit manager reports to the Software Development Department manager. There is no direct administrative authority or reporting between

project managers and project resources. The project managers' authority over project resources is limited to the scope of their projects and the time period they are assigned to their projects. Another important distinction is that project managers have no control over the budget of their projects. Such control is distributed between the functional unit manager and the Product Manager, based on the project. A close look at the organizational structure of the Software Development Department is given in Appendix B-2.

The company is very selective in hiring personnel. The adopted hiring standards are very high, and the greatest percentage of employees are young professionals. They either just graduated college or have no more than a two-year experience. The company believes in these employees and empowers them to manage and operate significant projects. This mostly applies to the project management team. Most project managers fall under the category mentioned above. They are organized using different position levels such as Project Coordinator, Junior Project Manager, Senior Project Manager, Program Manager, and Senior Program Manager. With no or few years of experience, most of the project management team members lack the strong project management experience and competence. Therefore, many of the project management activities are characterized with an ad-hoc approach.

The workplace politics in the company are set so that dependence on authority is minimal. Employees mostly rely on their interpersonal skills and relationships with their peers. This is very well demonstrated in how the project management team is placed compared to the other project team members from other units such as Software

Solutions, Database, and Quality assurance. The same concept is applied throughout the organization.

The company is also famous for its heavy workload environment. Employees learn about it before they join the company. The number of projects under development is big compared to the size of the company, the number of employees and the resources available. It's common to find employees dealing with multiple high-priority issues and many projects at the same time. Normally, working overtime hours in the company is another demonstration of the heavy workload.

3.2. Problem Definition

While the company already had a project management team, top management was still looking forward to take its project management competency and organizational maturity to the next level. In that direction, the company created PMO manager position that is on the same level of the Project Management unit manager. The PMO manager reports directly to the Software Development Department manager.

The conflict of interest between the Software Development Department manager, PMO manager, and Project Management unit manager didn't allow any real value to come out of the PMO manager position. Generally, the focus of the Project Management unit manager is on functional activities related to projects and their progress. In such condition, it is expected from the PMO manager to focus on the strategic perspective of projects-related activities and organizational project management aspects. Nonetheless, in the example discussed in this paper, instead of fulfilling his duties, the new PMO manager immediately engaged in collecting project

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information. This remained his main duty over the few months that followed. Such activity is mainly the responsibility and concern of the Project Management unit manager. As a result, the CEO decided to move the PMO manager position to the Strategic and Business Development Department. While the role of a PMO started yielding some results, the strategic value was never accomplished. In other words, no significant improvements were achieved on the project management organizational maturity. The PMO manager eventually left the company, and the position was consequently removed from the organizational structure of the company.

This study provides an attempt to resolve such situations. First, it will provide an assessment of the as-is status of the project management within the company. Second, a vision will be created for the to-be condition of the project management team, its competence, and its reflection on the project management maturity of the company. Last, this study will suggest a plan with the steps needed in order to introduce a PMO that would bring the project management maturity of the company to the next level. This new PMO plan will also be consistent with the strategic vision of the company.

4.   Results

Introducing a PMO into an organization is neither a straightforward process, nor is there a right or wrong way to do it. It is expected to be a comprehensive process that covers several aspects related to project management discipline and the overall organizational behavior and strategy. Instantis's approach to establish a PMO provides a rough outline of key areas to consider and main steps to follow. Some of these areas and steps have been the subject of research under the literature review of

this study. The remaining areas and steps are also important to investigate, and the available literature and resources provide answers for them. However, it would be beyond the scope of this study to give all the answers related to these steps.

The planning phase is actually where all critical decisions are made about establishing a PMO. This includes the areas investigated in this study such as PMO scope, PMO type, PMO hierarchy, PMO maturity, and PMO competency. Hence, concentrating on these areas through the steps suggested by the planning phase should be sufficient to put the PMO establishment on the right track.

The first step in planning is to define the PMO purpose and goals. They should be aligned with the strategy of the company, specifically in terms of vision, mission, values, objectives, and goals. It is answering the *why* question as shown in table 7. One aspect of it is the intention of the company to have strong project management capabilities not only for internal project, but to also provide project management as a service to other external organizations. Consequently, a statement of purpose, which includes a list of goals and objectives, should be put together. The steps that follow will mainly refer to the statement of purpose and goals in order to generate the expected benefit and value out of the PMO.

After that, the target scope and maturity of the PMO should be defined. As a start, the PMO should make an assessment of the current scope and maturity levels within the organization. According to PMI, there are three scope levels in project management: Project, Program, and Portfolio. Maturity levels, on the other hand, are different based on which PMM model is being used. There are many PMM models, and three of them were discussed under the literature review section of this study. The

three models are *(PM)²*, *CMMI for Development*, and *OPM3*. Instantis suggests the following graph as a way to demonstrate the current and target scope and maturity:

Figure 14: Demonstrating Current and Target PMO Scope and Maturity.

As explained in the company overview section, projects are distributed between two categories of owners. There is a central project management unit, which is a subunit under the Software Development Department. The other category is what the organizational structure states as Customer-Based units. There is no central project management office that oversees all of the projects the company is working on. In addition, the project scopes differ between the Software Development Department and the other Customer-Based units. For instance, the PMO scope in a Customer-Based unit may be project management, while the Software Development Department runs PMO scope of program management. As a result, the PMO may need to create multiple graphs that demonstrate the current and target PMO scope and maturity for each department.

The company already has program managers under the Software Development Department. Therefore, the project management scope is probably on the program

management level on the scale of PMO Scope. Customer-Based units do not have program managers. Hence, it is more likely that they are on the project management level.

Comparing these PMO scopes with the PMO types, it can be concluded that they are applicable to the operational scope categorization given in the literature review section. For that categorization, PMO types are Single Project PMO, Portfolio Management Office, and Customer Based PMO. The Customer-Based units can be considered a Customer-Based PMO. The Project Management Unit under the Software Development Department is neither a Single Project PMO, nor a Portfolio Management Office. It has multiple projects; therefore, it can't be a Single Project PMO. It doesn't oversee and capture all projects in the company; hence, it wouldn't be a Portfolio Management Office. It is somewhere in between, and mostly closer to being a Portfolio Management Office.

To determine the maturity level, the PMO has to decide on the PMM model to be used first. Such a decision could be a project on its own. An extensive analysis should be made to come up with the best PMM model that fits the needs of the company. In the analysis process, the PMO should consider several factors. The most important factor is the cost of adapting the PMM model. Some cost may be direct such as the cost related to purchasing the model material, and the cost of supportive tools. Other cost may be indirect costs, such as the time it takes to implement the model along with the skillset and qualifications required to manage it. While the cost may be high for some models, the PMO should also consider the ROI expected from implementing a model.

Moreover, the PMO should always keep the strategy of the company and the PMO goals in mind while selecting a PMM model. Not all models are expected to fulfill the strategic goals and objectives of the company. Furthermore, the industry plays an important factor in selecting a PMM model. (PM)^2 and OPM3 claim to be fit for multiple industries. However, the creators of the (PM)^2 model come from a civil engineering background. This could be a source of unintentional bias for that model. Also, the model is relatively simple when compared with other models.

CMMI, on the other hand, was developed by an institution specialized in software, which is the Software Engineering Institute (SEI). The CMMI v1.3 not only targeted specific businesses, but also created separate models. Each model was designed to conform to different businesses in the industry. These three models are CMMI for Development, CMMI for Services, and CMMI for Acquisition. Other than that, Both OPM3 and CMMI are very comprehensive in the process of improving organizational maturity.

One last factor to consider is the existing project management methodology adopted by the company. There are several methodologies in the industry, such as PMI, Prince2, and Agile Project Management. For instance, if the company is adopting Agile Project Management, then OPM3 as a PMI methodology may not be the best fit to work with it. These factors are examples of what should be analyzed in the process, but they are not all that must be considered. Therefore, a PMO should make sure to cover all possible factors based on its needs.

The third step in the planning phase is identifying the core services needed to achieve goals. According to Instantis, core services could be high level ones such as

business strategy alignment, or as functional as managing project schedules, risks, costs, quality, etc. Other services include methodology and process consistency, collaboration and knowledge management, professional/organizational development, and resource management. In this step, the PMO should consider the current and target PMO scope and maturity. Services should be prioritized and planned to consistently work with the current status and goals the PMO is set to achieve (Instantis, Inc., 2011).

In retrospect, a huge mistake in following this step led to the failure of the previously established PMO. The first core service the PMO attempted to engage in was low level and basic functionalities such as collecting and managing project-related information. The PMO seemed to lose focus of the strategic value it had to maintain. In fact, it only repeated the work that was already the responsibility of the current project management unit. The PMO should've started with more strategic activities. Even when the PMO attempts to do low-level functionalities, it should focus on higher priority activities that are not currently the responsibility of existing project managers.

A core service that the PMO should've focused on more is the professional and organizational development. The project management unit had a great room for improvement in regards of competency, which in return meant the PMO also had the chance to improve. However, there was no competency model applied, and the project management team could easily be marked on the low scale of any project management competency level model. The PMO could have applied the PMCD framework explained in the literature review, or any other competency framework

that fits the needs of the organization. If this PMCD framework had been used, the PMO could have started with low and medium rigor assessments. Later, the PMO would have performed high rigor assessment once it was capable of providing and administrating related supportive material and assessment tools. All of this should have been a part of the planned core services. After all, the PMO was going to take this plan into action as part of the fourth step in the implementation phase, which is skills assessment and development.

After defining core services, the PMO should also define the appropriate associated metrics for these services. Metrics are expected to serve as bases for measures. Without measures, it is hard to know how successful services are in creating the anticipated values from them. Measures allow for more benefits, including the ability to improve. They also allow for a comparative analysis of the performance of a single entity at different times, and different entities at the same time. Some of the metrics examples Instantis suggests include percentage of projects completed on time for methodology and process consistency services, and percentage of improvement in resource utilization for resource management services.

Step number five in the planning phase is defining business processes. For the core services the PMO is expected to perform, it should start with facilitating these services through efficient and effective processes. The chosen PMM model should be used as a guide while creating such processes. This is because the PMM model is expected to pave the path for these processes to support the advancement of the overall organizational maturity from one level to the next. Some processes may be defined internally and independently from external tools, while other processes are

actually predefined within existing solutions that can be acquired or licensed. For instance, there are many Project Portfolio Management solutions available, which provide predefined processes for resource management services. Knowledge transfer, however, can be done through a variety of methodologies. These may include traditional processes such as training, or more systematic processes that could be part of the PMO implemented information systems.

Defining governance, stakeholders, and PMO team structure is the sixth step in the planning phase. The PMO should identify the expected kinds of authority and relationship between the PMO staff and the project management team internally. It should also determine external relations with other functional units within the company and customers outside the company. In addition, the PMO structure must be defined along with the related roles and responsibilities (Instantis, Inc., 2011). This is where a critical decision has to be made about the PMO type and PMO hierarchy, both of which should be chosen compared to the potential variations provided in the literature review of this study.

TenStep's PMO type, which is based on the authority and the relationship between the PMO and project managers, has been a key factor in the failure of the previous PMO. When the PMO was established at the beginning, it was independent from the current project management unit, but still on the same level under Software Development Department. This means that project managers did not report to the PMO. Based on TenStep's PMO types, it is clear that the PMO was adopting a *Project Coordination* PMO model. The main activity the PMO started performing

was collecting all project information. As explained earlier, this is probably the number one reason for the PMO failure.

Several reasons can be easily identified for why the adopted *Projected Coordination* PMO type was the wrong decision. First, most of the project coordination activities were already handled by the current project management unit. This resulted in the duplication of work. Second, the tools used by the PMO were as basic as a word document template that required advanced levels of project management knowledge in order to have them filled out. Third, as explained in the company overview section, the project management team was mostly characterized by low levels of experiences and project management competences. As a result, there collected reports were weak, inaccurate, and/or incorrect. In fact, providing periodic reports to the PMO became a meaningless and inefficient load on the project management team, and consequently on the projects of the organization.

Alternatively, the PMO should adopt the Project Management Coaching type. With such a PMO type, the focus will be more on what the current project management unit is not doing or missing. This is especially the case with infrastructure and project management standards and guidelines. For instance, instead of rushing into collecting project information using inefficient tool such as Word document, the PMO could utilize a better tool that will actually add value and meaning to project managers and the organization. In addition, offering coaching services would be significant for project managers with low levels of experience and proficiency, which is the case for many within the project management unit.

The PMO hierarchy is another aspect related to the sixth step of the planning phase. To help determine the target PMO hierarchy, an assessment of the current PMO hierarchy should be made. From the evaluation of the organizational structure of the Software Development department given in Appendix B, along with the details given in the company overview section, the current PMO could be categorized as Strong Matrix organization. However, referring to the Organizational Influences on the Project given in Table 1, we can conclude that a Strong Matrix organization is not really applicable. What also contributes to this classification is that fact that project managers in the Software Development Department have no control over project budgets. The following table provides an evaluation of all of the elements given in Table 1:

Table 9: Organizational Structure Evaluation of the Software Development Department

Organization Structure / Project Characteristics	Project Management in the Software Development Department
Project Manager's Authority	Moderate
Resource Availability	Moderate
Project Budget Control	Functional Manager
Project Manager's Role	Full-time
Project Management Administrative Staff	Part-time

From the above table, three items match with both strong matrix and balanced matrix. These items are project manager's authority, resource availability, and project manager's role. However, two items do not match with a strong matrix organizational structure. Project budget control matches a weak matrix, while project management administrative staff matches both weak and balanced matrix.

The conclusion about the PMO hierarchy is that although the characteristics are not an exact match of a balanced matrix, some characteristics are pulling towards

the strong matrix, while others are pulling towards the weak matrix. Therefore, tagging the department as a balanced matrix organizational structure might be the most suitable category for it.

The new hierarchy of the organizational PMO should be a Composite Organization. The main PMO is a strategic department that oversees all projects and project managers in the organization. This PMO can be named as an Enterprise PMO, or EPMO. The remaining project management structures can be grouped under regular PMOs that report to the EPMO. The project management team under the Software Development Department can be considered as a balanced-matrix structure. Such structure can be promoted to a strong-matrix structure once the project management competency level has appropriately improved. The remaining PMOs are those associated with customer-based units. For such PMOs, a separate assessment has to be made and a plan should be created. This plan should provide steps on how their organizational structure can be improved to make the organizational project management activities consistent with the overall organizational strategy.

In order to prepare the planning phase and be able to proceed to the next phase, implementation, a timeline has to be created with planned dates for the identified steps and milestones. The timeline should outline the three phases of planning, implementing, and managing, along with the key steps and milestones in each of these phases. After that, a *charter* should be created with a summary of the phases, milestones, and steps the PMO will go through in its establishment process. The charter should also include brief information about the applicable tools, methodologies, and models that will be used, such as the maturity and competency

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models. That charter will be used to communicate the PMO plans to the company management to get their buy-in and support. Then, it will be the bases for what the PMO needs to do next.

5.   Conclusions

Introducing a PMO is a comprehensive process. When an organization attempts to create one, multiple key factors must be considered. First, the decision of establishing a PMO in the first place should be consistent with the overall organizational strategy. Another factor the PMO should consider is the appropriate PMO scope, type, hierarchy, maturity, and competence. The PMO should consider existing methodologies and steps used for establishing a PMO.

PMI defines three PMO scopes: project management, program management, and portfolio management. In addition, three PMO types based on operational scope were defined by Al-Maghraby. The PMO types are Single Project PMO, Portfolio Management Office, and Customer Based PMO. On the other hand, there are four PMO types based on their degree of influence and accountability according to TenStep. They are Project Coordination, Project Management Infrastructure, Project Management Coaching, and Project Management Resource Center. PMO hierarchies vary from functional, matrix, projectized, and composite.

There are many models that can help improve PMO maturity. The PMM models discussed were $(PM)^2$, CMMI, and OPM3. PMO competency is a different aspect that can be handled using other models known as competency frameworks. The PMCD framework was discussed as an example for the purposes of measuring and improving the PMO competency.

To put all of these aspects together, the PMO should follow certain steps and make the appropriate decisions and plan to be efficient and effective. Also, there are several methodologies to establish a PMO. The Instantis approach was used as an example for this study.

During the analysis of the previous PMO failure, several factors were identified as the potential reasons for such disappointing results. First, the new PMO got immediately involved into nonstrategic activities, such as collecting project information. There were no signs of any strategic planning. In fact, the PMO seemed to compete with the existing project management unit. As a result, the PMO work became a duplicate of what the original project management unit was doing in the first place. In addition, the PMO didn't consider the current competency level of the project management unit. It assumed that all project managers are highly competent and are fully capable of managing projects and building related documents and reports. Finally, the PMO didn't take the time to create the right tools for project managers to use in reporting their project information.

The project management unit did not manage all projects. Customer-based units were also another way of managing projects for external customers. Therefore, the company made the right decision to move the PMO from the Software Development Department to the Strategic and Business Development Department. This would allow the PMO to oversee not only the projects under the project management unit, but also the remaining projects under customer-based units.

Several recommendations were made for the PMO to avoid failure. The PMO should engage in more strategic activities and planning. It should start with

identifying the goals and objectives of the PMO and keep them aligned with the strategy of the company. Furthermore, PMM models should be analyzed. Then, the appropriate model should be selected and adopted as a strategic tool to improve the organizational project management maturity. Moreover, a project management competency framework should be used to assess and improve the proficiency of project managers; hence, the organizational project management capabilities. Finally, instead of implementing a Project Coordination PMO type, a Project Management Coaching PMO type would be more suitable for the needs of the existing project mangers and the project management unit in general.

6.   Suggestions for Additional Work

The scope of this study limited the analysis of further PMO related topics. Further investigation could have been for topics such as Project Management Maturity (PMM), Project Management Competency, and the steps of establishing a PMO. Going through these topics and others related to PMO, this study followed a broad analysis rather than an in-depth approach. This was the logical step as an initial attempt to solve the problem at hand. The next logical step is to make an in-depth analysis of one or each of the key topics and areas such as the ones mentioned above.

A more in-depth analysis can be conducted about available PMM models. The analysis could be a comparison between available models, stating the advantage and disadvantages of each. Another way of analyzing them is to review the steps needed to apply one of these PMM models. For example, a plan can be created to demonstrate how a specific PMM model can be implemented. This includes a short-term and a long-term plan. The same can be done with project management

competency frameworks. A comparative, planning and/or implementation analysis can be made.

The planning phase discussed in the result section was a high level examination of Instantis approach. There is a great room for improvement in the given planning analysis. More details could be added, and specific timeline could be included as well for the planning phase and the other two phases. This study mainly emphasized the planning phase of establishing a PMO. Additional work could discuss the *implement* and *manage* phases according to Instantis approach.

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8.   Appendices

8.1.   Appendix A – Project Management Organizational Structures

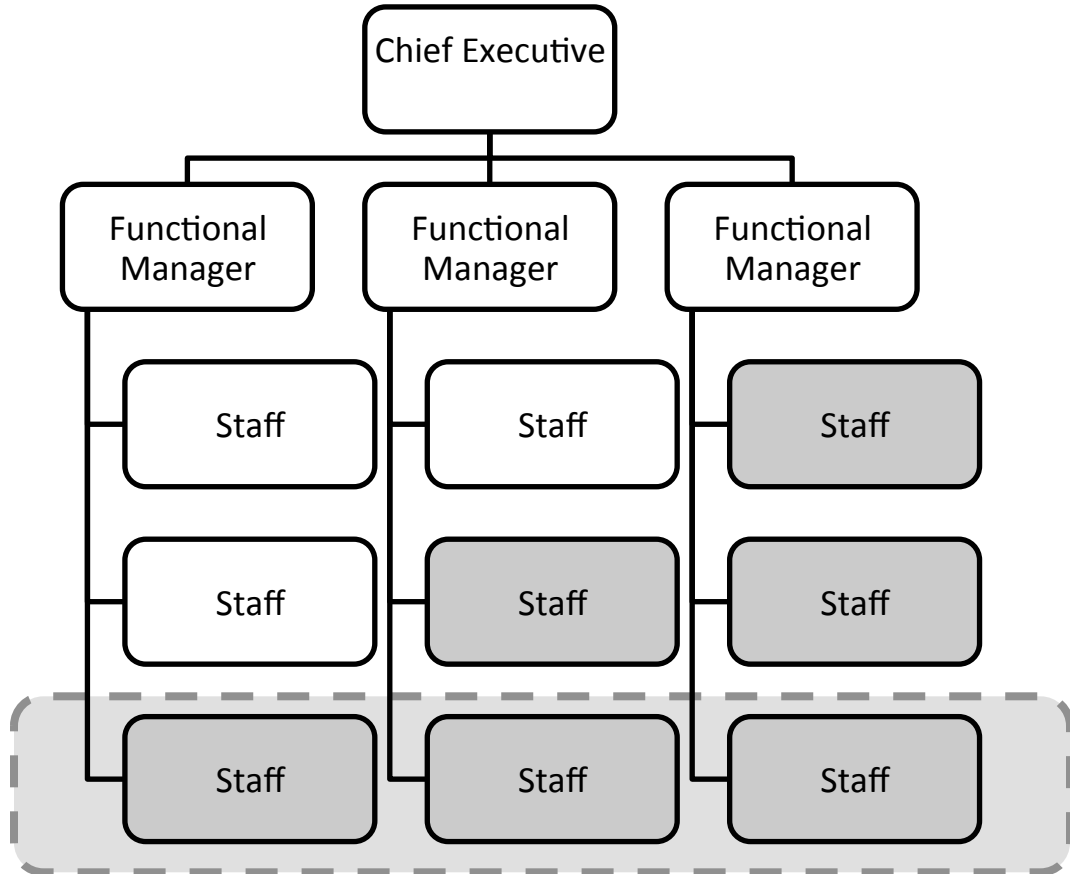### 8.1.1. Functional Organization

In the chart below, the functional managers that are grouped with a dotted line is where project coordination takes place. Staffs that are highlighted with gray boxes are the ones involved with the project.
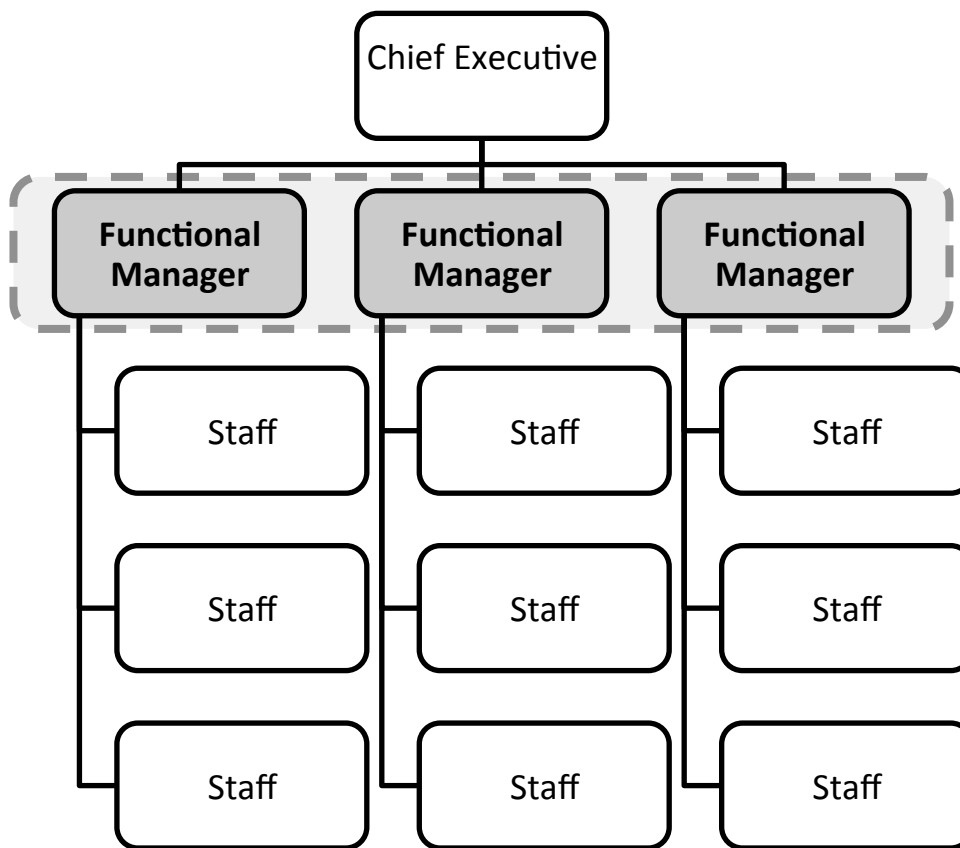
Appendix A - 1: Functional Organization

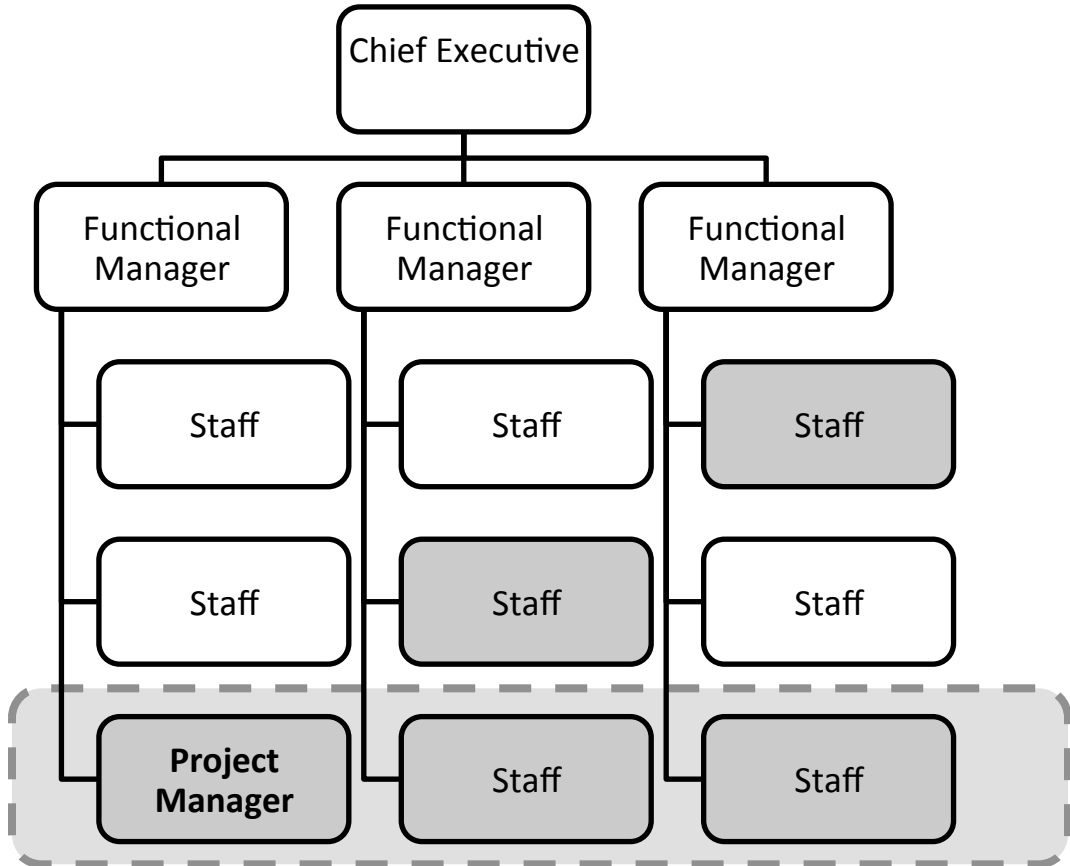## 8.1.2. Weak Matrix Organization

In the chart below, the staffs that are grouped with a dotted line is where project coordination takes place. Staffs that are highlighted with gray boxes are the ones involved with the project.

Appendix A - 2: Weak Matrix Organization

8.1.3. Balanced Matrix Organization

In the chart below, the dotted line is where the Project Manager is, and where project coordination takes place. Staffs that are highlighted with gray boxes are the ones involved with the project.

Appendix A - 3: Balanced Matrix Organization

8.1.4. Strong Matrix Organization

In the chart below, the dotted line is where the Project Manager is. Staffs that are highlighted with gray boxes are the ones involved with the project.
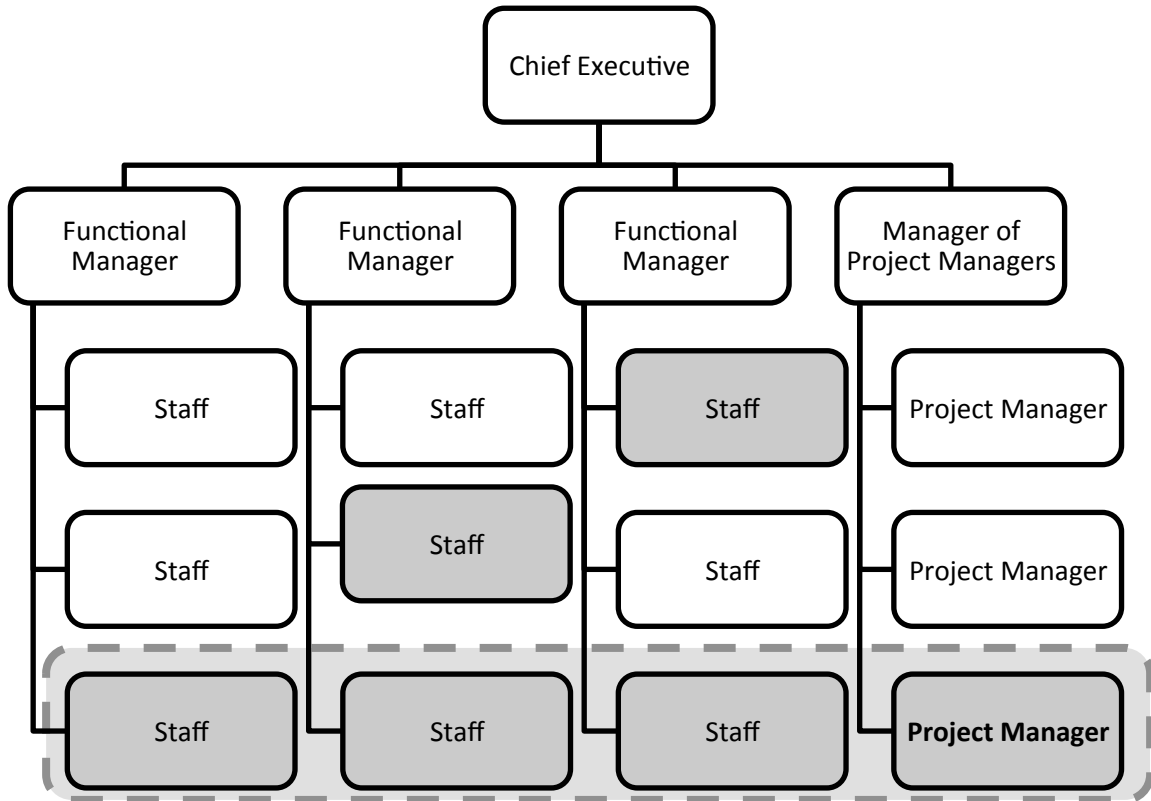
Appendix A - 4: Strong Matrix Organization
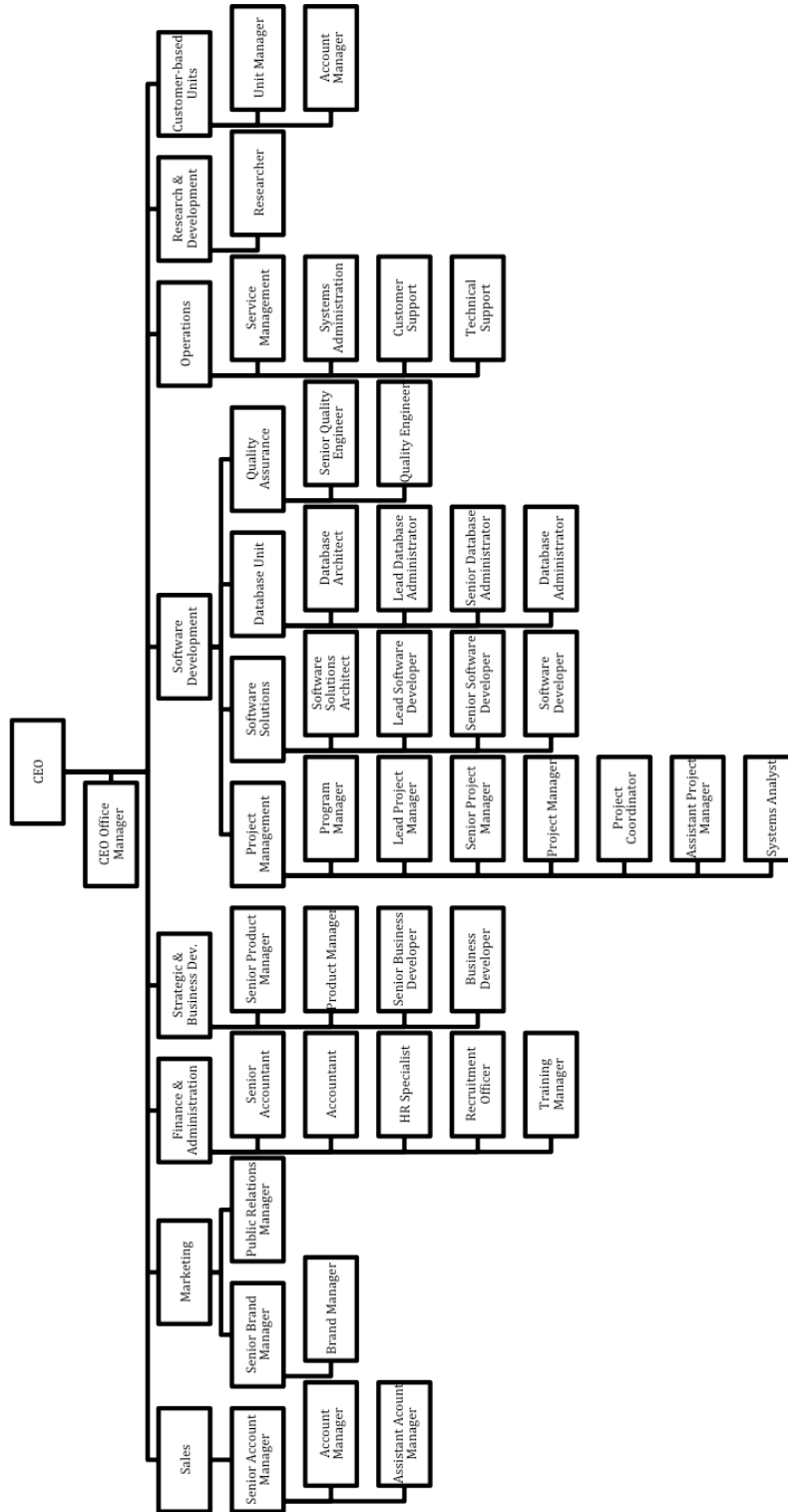
8.1.5. Projectized Organization

In the chart below, the dotted line is where the Project Manager coordinates the project, and staff that are involved with the project.
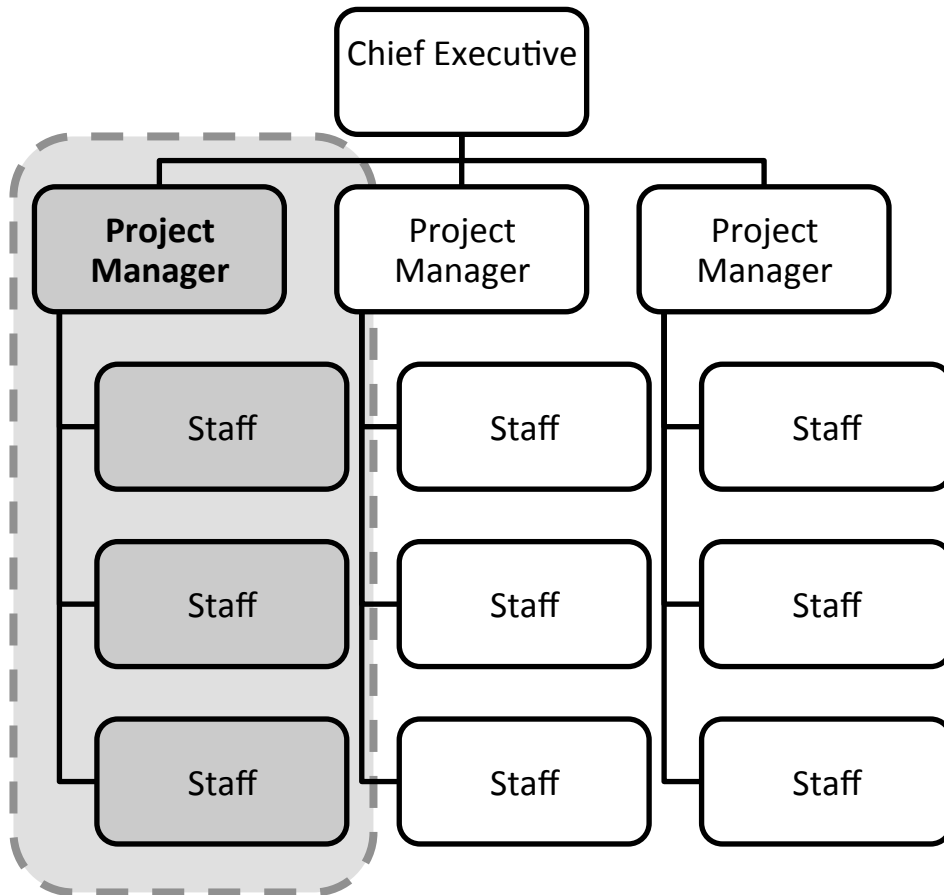
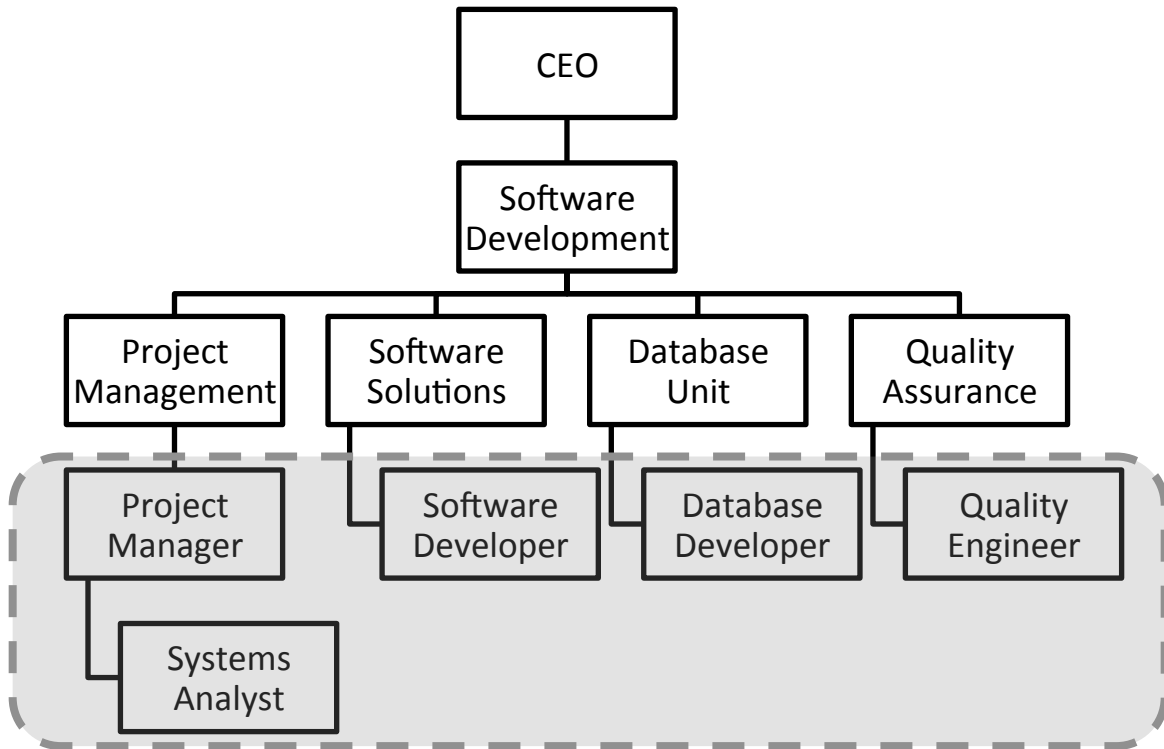*Appendix A - 5:Projectized Organization*

8.2. Appendix B – The Company Organizational Structure

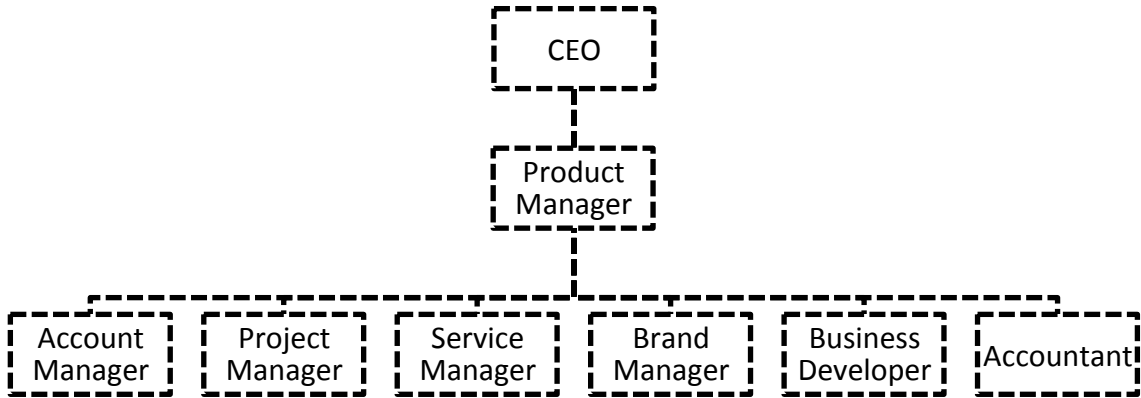### 8.2.1. Overall Organizational Structure

Appendix B - 1: Overall Organizational Structure

8.2.2. Software Development Organizational Structure

Appendix B - 2: Typical Project Team within Software Development Organizational Structure

8.2.3. Company Cross-Functional Team Organizational Structure

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                        │    CEO    │
                        └ ─ ─ ─ ─ ─ ┘
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                        │  Product  │
                        │  Manager  │
                        └ ─ ─ ─ ─ ─ ┘
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│Account│ │Project│ │Service│ │ Brand │ │Business│ │Accountant│
│Manager│ │Manager│ │Manager│ │Manager│ │Developer│ │        │
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Appendix B - 3: Company Cross-Functional Team Organizational Structure