UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL (UCI)

IMPLEMENTATION OF A PROJECT MANAGEMENT OFFICE (PMO) IN A CONSTRUCTION COMPANY IN ECUADOR

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER'S IN PROJECT MANAGEMENT (MPM) DEGREE

San José, Costa Rica

November 2021

UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL (UCI)

This Final Graduation Project was approved by the University as

partial fulfillment of the requirements to opt for the

Master's in project management (MPM) Degree

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Los suscritos, Elena Redondo Camacho, mayor, casada, filóloga, incorporada a la Asociación Costarricense de Filólogos con el número de carné 0247, portadora de la cédula de identidad número 3-0447-0799 y, Daniel González Monge, mayor, casado, filólogo, incorporado a la Asociación Costarricense de Filólogos con el número de carné 0245, portador de la cédula de identidad número 1-1345-0416, ambos vecinos de Quebradilla de Cartago, revisamos el trabajo final de graduación que se titula: *IMPLEMENTATION OF A PROJECT MANAGEMENT OFFICE (PMO) IN A CONSTRUCTION COMPANY IN ECUADOR*, sustentado por María Cristina Ávalos Aguilar.

Hacemos constar que se corrigieron aspectos de ortografía, redacción, estilo y otros vicios del lenguaje que se pudieron trasladar al texto. A pesar de esto, la originalidad y la validez del contenido son responsabilidad directa del autor.

Esperamos que nuestra participación satisfaga los requerimientos de la Universidad para la Cooperación Internacional.

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Dedication

This work is dedicated to my family, who supported me through the development of this work in many ways.

Acknowledgments

Abstract

Currently, companies worldwide must always be at the forefront of new methodologies and techniques. Therefore, the importance of implementing a Project Management Office PMO in a construction company to manage all the company's projects under the PMBOK Guide (PMI, 2017) six edition guidelines.

The construction company is in Quito, Ecuador, and has more than six decades in the field of construction; the company is always up to date in technology and construction methodologies. However, it does not have an area in charge of managing or assisting in executing projects and compiling the lessons learned.

The current project will focus on implementing a Project Management Office PMO in the construction company to manage all the projects and have the support and control in each of them, which will allow them to fulfill their company work.

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Abbreviations And Acronyms

- BIM   Building Information Modelling.

- CEO   Chief Executive Officer.

- CMM   Capability Maturity Model.

- FGP   Final gradation project.

- KPI   Key Performance Indicators.

- OPM3   Organizational Project Management Maturity Model.

- P3M3   Portfolio, Program, and Project Management Maturity Model.

- PM   Project Manager.

- PM2   Project Management Maturity Model.

- PMBOK   Project Management Book of Knowledge.

- PMI   Project Management Institute.

- PMMM   Project Management Maturity Model.

- PMO   Project management Office.

- PMO   Project Management Office.

- WBS   Work Breakdown Structure.

Executive Summary

Currently, the companies seek ways to implement and improve their methodologies to be more effective in their performance area and acquire more clients and projects.

The construction company in Ecuador focuses on constructing different typologies of buildings and materials and constantly seeks new construction methodologies and techniques. There is a need to implement an office or unit that allows improving the management of the projects that it implements, those that are oriented towards construction, as well as its resources, in addition to acquiring the appropriate tools to manage these projects successfully and have the support and control in each of them, which will allow them to fulfill their company work.

This proposal is justified on the premise of implementing a Project Management Office to improve the management and achievement of projects due to the quality of professional training.

Within the document is the proposal's general objective: To implement As specific objectives, an analysis of the company's current situation in the area of projects is made explicit to identify areas for improvement and balance strengths and weaknesses of the lessons learned in project management practice. Design the PMO structure that adjusts the best to the company to achieve its implementation in the short term based on the PMI standards; define the functions and responsibilities of the PMO office to implement a specific model to the institution's needs. Additionally, determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure and propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it to measure its performance and improve it.

All this is proposed by maintaining the logical criteria of the company functions, proposing the strategies derived from the vision, taking care of the fulfillment of the objectives, requesting the change in its organizational structure that allows a change in the procedures and the precaution of being able to implement a model standardized in the projects that are developed, this entire list of actions can be carried out within the Construction Company.

Various sources of information were used through knowledge of books, surveys, and those involved in project management. The necessary development stages were proposed to put into

practice the most recommended techniques and tools that would allow an action plan to be obtained as a result.

Every objective was analyzed to obtain and have a clear perspective of the project itself through investigative methods that include analysis, synthesis, induction, and deduction. Starting with the identification of each of the areas that intervene in the formulation or design of the projects and their management in the execution of the integral professional training that the company has, as a methodological strategy between them and their relationship with the set of necessary activities.

The Project Management Office is based on the PMBOK Guide (PMI, 2017) six edition standard, summoning the necessary processes and their management areas according to their applicability.

Among the results produced by these tools, we find that there are aspects that must be reinforced, and from there, the needs to implement the project office and the required personnel and their capacities to integrate the project office are defined. The correct and more suitable Project Management Office was chosen according to the information of the company's maturity level and, from this selection, how the PMO will be implemented in the company's organization structure.

The company and its processes are in a unique methodology maturity level, which means that some processes are already on the correct path, according to the PMBOK Guide (PMI, 2017). Some are still unclear on the procedure; this leads to a hybrid PMO that can control and support the projects according to their need.

As for recommendations, the company has to implement more resources and plans in risk management and consider the possibility of training their staff in project management to have a common knowledge and language.

1. INTRODUCTION

1.1. Background

This project takes place in a construction company in Ecuador. The approach focuses on defining the changes necessary to implement a Project Management Office (PMO) and the company's transformation in its management, under a new approach that allows repowering the institutional mission and meeting the company's and society's requirements.

Within the new approaches in management and construction, the importance of projects has begun to be noticed as a methodological foundation to generate value and develop the integration capacity towards international and national markets through competitive advantages. Therefore, the company's relevance in implementing new control measures and generating knowledge through the project management office.

1.2. Statement of the problem

The construction company, in recent years, has implemented different methodologies whose purpose is to improve the company's processes and offer a better service to our customers; due to this, the company requires the implementation of a Project Management Office (PMO) to manage and control all these processes, and project performed in the company.

Currently, the company's projects are managed from different perspectives, depending on the client's demands, the different areas involved, and the internal strategic plan to improve skills and the infrastructure and physical resources available to the company.

In the first instance, the execution of a project implies having presented a proposal. The terms of cost, time, quality, and deliverables of the project and the measurement indicators for the partial and final evaluation were defined.

Once the proposal is approved, a project manager is appointed internally (until now, the company's project managers do not follow common standards) and the administrative and technical support team that the project will have.

Currently, the personnel involved in the execution of the project do not know all the components of the project and its deliverables; they only know their responsibility and the deliverables they

must carry out. There is no training to execute the project itself, only internal administrative aspects to comply with accounting, labor, tax, and technical standards.

The company does not have an area in its organization chart that is in charge of the projects. For this reason, the project managers do not follow the rules and guidelines of the PMBOK Guide (PMI, 2017). Each project manager has their templates and way of managing a project; however, not all have adequate preparation and knowledge, leading to specific execution, scope, cost, or time problems.

Currently there are not common quantifiable indicators, however at the end of the projects the CEO and the financial department analyze each project and the profit of it, if the profit is less than expected at the beginning of the project life, the project is in loss and if the profit is higher than expected is a good project for the company.

Normally the company has a good impression in the country, there are not compliances or customer dissatisfaction, but the company is willing to give a better and complete service to their clients by implementing a project management office, and have a better management in projects.

As an improvement of the services, the company is offering what they call "One Stop Shop", this means that the company offers a multitude of products and services in a single place so is important to have a clear idea and process of the execution and management of the projects the company have and will have.

1.3. Purpose

The project will be based on one of the largest construction companies in Ecuador; due to internal politics and conflicts of interest, the company's name will remain anonymous.

The company has been in the construction market for more than 60 years and has always been a pioneer in implementing new processes or requirements that benefit the company and the client; however, it does not have a Project Management Office (PMO) that give institutional guidelines clear, and of support or control to the projects that the company has.

The lack of a project office means that projects do not have a common language in their execution, the project managers do not always follow the PMBOK Guide (PMI, 2017) guidelines, which

causes projects to have problems in different areas, such as cost, time, or scope, and eventually, this will affect the company.

The purpose of a Project Management Office (PMO) will allow the projects to manage a common language between them, the control of time, costs, and scope will be of general knowledge among all those involved, information can be collected from each project for future needs, and all the projects will be aligned with the PMBOK Guide (PMI, 2017) knowledge areas and processes.

The Project Management Office (PMO) will standardize methodologies, procedures, and required IT tools and have a permanent and constant support structure to allow better performance when executing projects. Additionally, the PMO is expecting to bring benefits such as:

- Execution times and optimization of resources could be improved since the planning, control and allocation process of resources would be better by having an office responsible for executing the corporation's portfolio of projects.

- The process of qualification and training of those in charge of the management of the projects, the work teams selected for its execution and the support personnel.

- The monitoring and control of the different projects would be centralized and not dispersed as it currently has; this facilitates the evaluation, monitoring and evaluation of risks in the organization and each of the projects.

1.4. General objective

To implement a Project Management Office (PMO) for a construction company to maximize and optimize the results of the projects done by the company.

1.5. Specific objectives

1. To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.

2. To analyze the different PMO types in order to establish the most suitable for the construction company.

3. To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.

4. To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.

5. To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it, to measure its performance and improve it.

2. THEORETICAL FRAMEWORK

2.1. Company/Enterprise framework

This project takes place in Quito, Ecuador, in one of the leading construction companies in Ecuador. The construction company is a medium-sized construction company registered as such under the company's registration of Ecuador.

2.1.1. Company/Enterprise background

The company was legally established in 1972; however, the founders started the company in 1955. The first project the company built was the house of Gonzalo Zaldumbide in Quito downtown. Since then, the company has built almost every kind of typology of structures, residential buildings, buildings, bridges, tunnels, parks, roads, hotels, hospitals, drinking water systems, irrigation works, schools, among others, in almost all the provinces of the country.

The company is always at the forefront of methodological and technological advances in the construction field. Each day the fields of action increase, and the company is innovative and constantly evolving. The relevance of this fact lies in the fact that thanks to this diversification, the company has managed to enrich its daily work for the benefit of its customers.

Nowadays, the company has been managed by the third generation of the family, this symbiosis of a family, and the vast experience of the workers, make the company be one of the biggest construction companies in the country, with the merit of being a company that has completed 100% of the work, entrusted to the complete satisfaction of its clients.

2.1.2. Mission and vision statements

2.1.2.1. Mission

The company mission is to provide the best services in the construction industry and efficient management, under strict control of quality, time, and cost; for doing so is necessary to implement a project management office to control or support all the activities of the different project the company has and improve the existing procedures.

2.1.2.2. Vision

The company vision is to position itself as the best construction company, capable of efficiently serving all the construction industry areas in Ecuador and Latin America; implementing standardized and international processes for project management, the company will achieve its business vision.

2.1.3. Organizational structure

The company has ten different areas that are under the CEO Head, each area has different roles and responsibilities, as *Figure 1* shows under the CEO but above the department is the technical manager, which is in charge of the project managers who in turn are in charge of the project staff such as superintendent and resident. The PMO will be added instead of the technical manager and will be part of the departments or areas of the company; this will help introduce new procedures and improve the existing ones.

Figure 1
Organizational structure
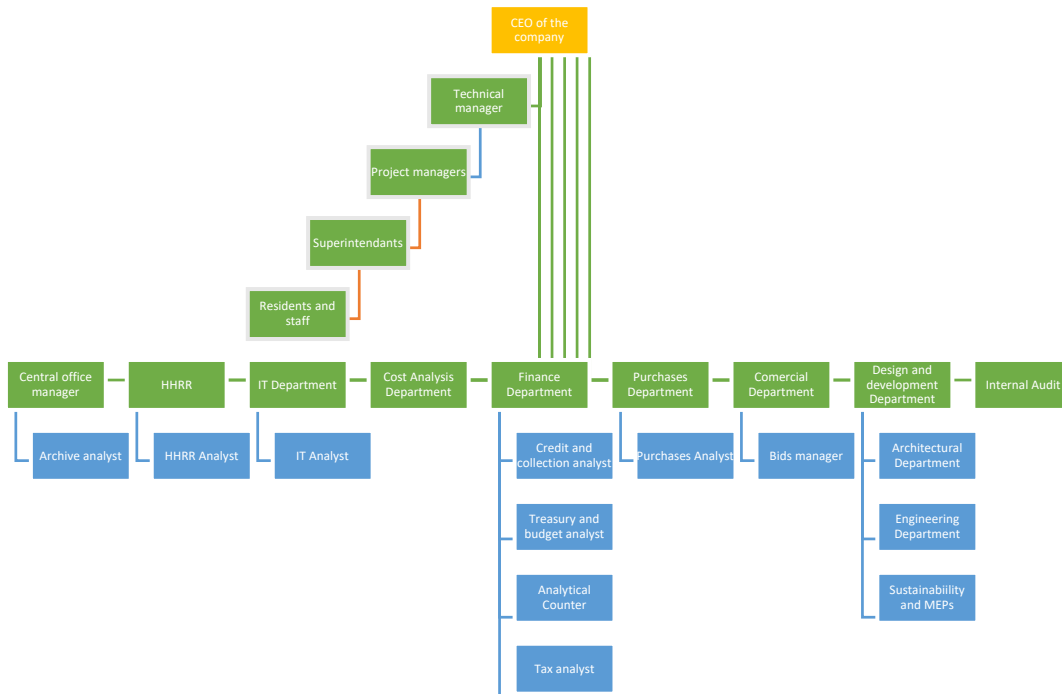
(Source: Anonymous Construction Company).

2.1.4. Products offered

The company's main activity is construction; however, it also carries out architectural and structural design activities.

The company handles different contracts for construction, such as fixed prices, delegated administration, and unit prices. The company offers construction services from the beginning of the project, repairs, extensions, maintenance, and remodeling.

The company is using what we call a "one-stop-shop", so we offer everything the client needs in order to avoid misunderstood and complications to the client, what is more the design and development department uses the latest technology such as BIM (Building Information Modelling), LEAN methodology, last planner system., and agile methodologies such as scrum.

2.2. Project management concepts

2.2.1. Project

A project is a temporary effort to create a unique product, service, or result (PMI, 2020).

Temporary means that a project has a beginning and an end, the end of the project is reached when the objectives of the project are completed, or it becomes clear that the objectives will not be achieved, or the need for the project disappears or that the project is canceled (Bolaño, 2014).

2.2.2. Project management

Project management, in its modern form, began to take hold only a few decades ago. Starting in the early '60s, companies and organizations began to see the benefits of organizing work in the form of projects. This project-centric organizational perspective evolved further as organizations began to understand the fundamental need for their employees to communicate and collaborate while integrating their work across different departments, professions, and, in some cases, entire industries (Bolaño, 2014).

Project management refers to applying good practices in the management of any project; it is the application of knowledge, skills, abilities, tools, and techniques to the project's activities to achieve its objectives. Project management has always been informal but emerged in the mid-20th century as a distinguished profession (PMI, 2020).

Project management includes identifying stakeholders, establishing clear and achievable objectives, managing the requirements of quality, scope, time, and costs of the project, and responding to the concerns and requirements of the interested parties.

Project management has five different processes, the initiation, planning, execution, monitoring and control and closure, all involved with at least one of the following areas of knowledge that are, integration, scope, time, cost, quality, procurement, human resources, communication, risk management, and stakeholder management.

2.2.3. Project life cycle

A project, being a temporary activity, has an associated life cycle. As previously mentioned, the cycle is initiation, planning, execution, monitoring, control, and closure.

The project life cycle defines the phases that connect the beginning of a project to its end. For example, when an organization identifies an opportunity that it would be interested in responding to, it frequently authorizes a feasibility study to decide whether to undertake the project. Defining the project life cycle can help the project manager determine whether to treat the feasibility study as the first phase of the project or as a separate and independent project. When the outcome of such a preliminary effort is not identifiable, it is best to treat such efforts as a separate project. It is essential to understand that the phases of the life cycle of a project are not the same as the Project Management Process Groups.

The transition from one phase to another within the life cycle of a project involves and is generally defined by some form of technical transfer. Typically, deliverables in one phase are reviewed for completeness, accuracy, and approved before starting work on the next phase. However, it is not unusual for a phase to begin prior to the approval of the deliverables of the previous phase when the risks involved are considered acceptable.

This practice of overlapping phases, usually done sequentially, is an example of applying the schedule compression technique called "fast track".

It is worth mentioning that there are different types of projects according to their life cycle:

- Predictive or cascade: It is the one in which the scope, time, and cost necessary to achieve the scope is determined early as possible in the project life cycle. In a predictive

life cycle, the product and the deliverables are defined at the beginning of the project, and any changes in scope are carefully managed.

- Adaptive: They are those that tend to respond to high levels of change and stakeholder expectations. Projects and project management are carried out in a broader environment than that attributable to the project itself. The project management team must understand this broader context to select the life cycle phases, processes, and tools and techniques appropriate for the project.

- Iterative: The activities are intentionally repeated within the project phases as the result or product is known. The product is developed after multiple iterations, and the detailed scope for each iteration is defined only at the beginning of it.

2.2.4. Project management processes

Project management processes are activities that are developed during the project life cycle. Each process has a different level of effort and life phase in which they participated; as *Figure 2* shows, there are five process groups: initiating, planning, execution, monitoring and control, and closing.

Figure 2
Process group interactions within a project or phase
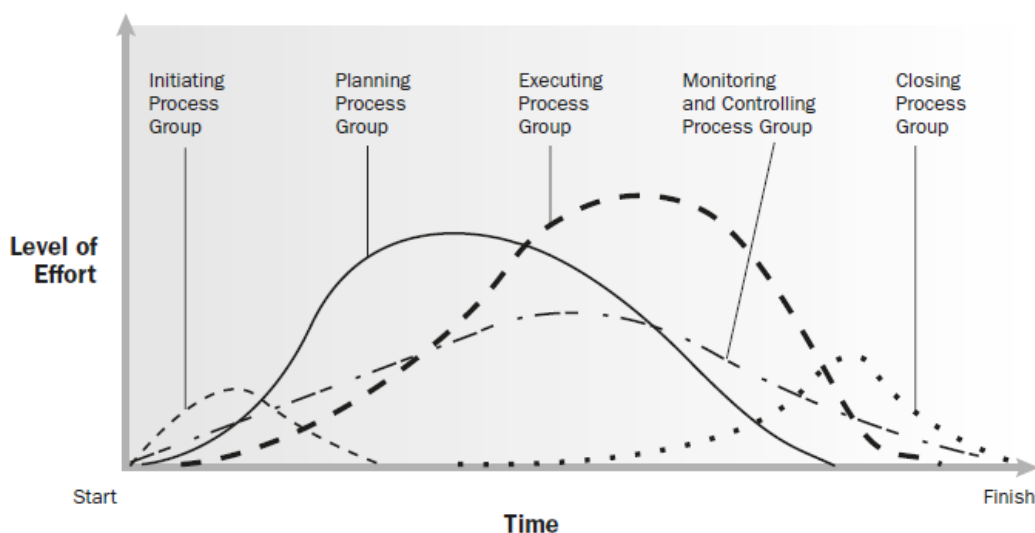
Source: (PMI, 2017).

The initiating process group is the first, and it is at this stage, the need for the project is identified, and its possible benefits or difficulties are estimated. In addition, the majority of those involved are identified; the main product of this process is the project charter.

The planning process is the decision on how the project will be carried on, the scope is defined, the WBS is created, the requirements are collected, the sequence of activities is defined, the costs are estimated, and the main activity of this process is that your output is the project management plan.

Executing process is the process where purchases are made, and project work or activities are implemented. The project team is acquired, developed, and managed; stakeholder expectations are managed.

Monitoring and control process, here the integrated change control is carried out. It is verified that the plan developed during the execution process is respected; the schedule of activities is controlled.

Closing process consists of performing processes to conclude all activities to formally complete the project, phase, or contractual obligations. This process group, when completed, verifies that the defined processes are completed within all of the Process Groups.

2.2.5. Project management knowledge areas

According to the PMBOK Guide (PMI, 2017), there are 10 different knowledge areas and 47 processes. The following sections summarize the information of each one and its correspondence between them:

Project integration management: In project management, integration includes features of unification, consolidation, communication and integration actions that are crucial to control project execution to completion successfully manage stakeholder expectations and meet the requirements (PMI, 2017).

Project scope management: Includes the processes required to ensure that the project specifies all the work required and only the work required to complete the project (PMI, 2017) successfully.

Project schedule management includes the processes required to manage the project's timely completion (PMI, 2017).

Project cost management: Includes the processes related to planning, estimating, budgeting, financing, funding, management, and cost control, so that the project can be completed with the approved budget (PMI, 2017).

Project quality management: Includes the processes and activities of the organization's performance that determine the quality policies, objectives, and responsibilities so that the project meets the needs for which it was undertaken (PMI, 2017).

Project resource management: Includes the processes that organize, manage, and lead the project team (PMI, 2017).

Project communications management: Includes the processes required to ensure the timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and final disposal of project information (PMI, 2017).

Project risk management: Includes the processes to carry out risk planning management, its identification, response plans and the control of project risks (PMI, 2017).

Project procurement management: Includes the processes necessary to acquire or purchase additional products, services, or results from the project team. (PMI, 2017).

Project stakeholder management: Includes the processes required to identify the people, groups or organizations that may affect or be impacted by the project, analyze stakeholder expectations and their impacts on the project, and adequately develop management strategies. Management to effectively appropriate stakeholders in the decisions and implementation of the project (PMI, 2017).

2.3. Maturity Models in project management

The maturity model in project management is a concept that lets Project-Based Organizations assess their project management success. Depending on the ideology of each model, there are different levels of project management maturity that each business must go through to succeed (ClickUp, 2021).

There are different models, among which are: Harold Kerzner's PMMM, PMI's OPM3, PM2, P3M3, CMM, among others. Each defines different levels within which the organization can be found and characterize its degree of maturity.

2.3.1. Harold Kerzner Model- PMMM

The Project Management Maturity Model (PMMM or KPM3) is the acronym in English for the Project Management Maturity Model, defined by Harold Kerzner (2005), consists of a model for measuring organizational maturity that is the basis for achieving excellence.

This model is a guide to potentiate competitive advantages and continuous improvement of companies; it contains "Benchmarking" tools to measure an organization's progress within a maturity model. The model has five levels of development to reach full maturity in project management.

Level 1 "Common language", in this, the organization recognizes the importance of project management and the need for a good understanding of the basic knowledge in this discipline, which must be supported by standard language or terminology (Redondo Salas, 2017).

Level 2: "Common processes", at this level, the organization recognizes the need to define and develop standard processes as a means for the success of projects, which may be repeated in other projects. This level includes recognizing the need to apply and support projects with project management principles and own methodologies that the company may use (Redondo Salas, 2017).

Level 3: "Unique methodology", at this level, the organization perceives and values the synergistic synergy effect that the combination of all the organization's methodologies has within a single methodology. With a unique methodology, the synergistic effects make it easier.

Level 4: "Benchmarking", at this level, the fact that process improvement is a fundamental action to achieve or maintain a competitive advantage is identified. The company establishes with whom it makes this comparison and the findings it will use.

Level 5: "Continuous improvement", here the organization has reached a level where it evaluates the information obtained through the benchmarking process and establishes whether this information will become a unique methodology for the organization (Redondo Salas, 2017).

The development of the levels is not necessarily sequential, since you can go working on elements of several levels simultaneously; all this depends on the irrigation that the Organization is willing to run in the implementation of the model.

2.3.2. OPM3 Model

The OPM3 model is the Organizational Project Management Maturity Model (Organizational Project Management Maturity Model). It is a standard promoted and developed by PMI in 2003, allowing organizations to improve the management of their projects, programs, and portfolios through a set of better practices(PMI, 2017).

The OPM3 model presents three elements that are described below:

Knowledge: a compendium of globally identified and recommended practices. The organization is required to have a level of knowledge for the implementation and maturation of the processes. Includes knowledge of the OPM3® standard.

Assessment: assessment of the strengths and weaknesses of the practices, which results in a "GAP Analysis" of those practices and capacities that need more attention and the planning of improving the processes.

Improvement: implementation of the process improvement plan. Improvement may involve organizational development, restructuring, changes in management, skills, and abilities training, among other improvement actions.

2.3.3. Capability maturity model (CMM)

Carnegie-Mellon University developed it for the SEI (Software Engineering Institute), which is a research and development center sponsored by the United States Department of Defense and managed by Carnegie-Mellon University. "CMM" is a registered trademark of the SEI. The model was initially published in 1987, and its latest version was v.1.1, published in 1993.

In 2006, the Software Engineering Institute: "Developed a more improved version of the Capability Maturity Model known as the Capability Maturity Model Integration (CMMI). The CMMI framework addresses some of the limitations of the CMM, gaining immense popularity in the process" (CFI Education Inc., 2021, n. p.).

The practices established in this model are grouped into key areas, and for each process area, it defines a set of good practices that will be:

- Defined in a documented procedure

- Provided (the organization) with the necessary means and training

- Executed in a systematic, universal, and uniform way (institutionalized)

- Measures

- Verified

2.4. Types of organizational structures

According to PMBOK Guide (PMI, 2017) sixth edition, there are various ways for organizations to create their structure. Their operation responds efficiently to the strategic and operational conditions and the established lines of power (PMI, 2017).

Some of the organizational forms that can be adopted are linear, functional, matrix and projected, which have unique characteristics that favor the development of projects, programs, or project portfolios in terms of their administration.

A linear organizational structure considers hierarchy as an organizing principle, that is, the direct authority of the boss over his subordinates, since all decisions and responsibilities fall on him. It is a structure that favors speed, clear and straightforward accounting, since the positions are very well delimited in the structure, with employees attending to the guidance of a shared boss. It is the preferred model for small companies with low production and little human capital (Raffino, 2020).

A functional organization proposes dividing the organization's work into hyper-specialized units, each one under the command of an independent boss, who coordinates his work team and allows communication with the other teams. It is versatile, flexible, and very popular, especially for large companies with abundant staff (Raffino, 2020).

A matrix organization structure:

Is structured based on autonomous and disconnected work teams; each assigned to a specific project and made up of a diverse group of workers under the command of a

coordinator who reports individually at the head of the organization. It is the most dispersed structure known and the one that best suits the gigantic transnational business consortiums (Raffino, 2020, n. p.).

2.5. Project Management Office (PMO)

To have a better concept of PMO, the following definitions of PMO are presented:

- Definition 1: is the management structure that standardizes the governance processes related to projects and helps to facilitate the use of resources, tools, methodologies, and techniques (PMI, 2017)

- Definition 2: It is an organizational group responsible for coordinating the project management function throughout the organization. (Bolaño, 2014)

The Project Management Office should emphasize coordinated planning, prioritization and execution of projects linked to business objectives. This office comprises people trained in managing the company's projects, which provides the company with best practices to promote continuous progress in project management.

A PMO will be what the organization requires it to be. It can be so simple that you only have a few people who prepare and maintain project information. It can be made up of people who do the planning, execution, reporting, quality assurance, and gathering of performance information of the projects.

According to PMI (2017): "A PMO may have the authority to act as an integral stakeholder and make key decisions throughout the life of the project, make recommendations and terminate the project or take other actions if necessary" (Bolaño, 2014, n. p.).

The PMO may also be responsible for providing standardized policies and procedures and even for training, administration of software and tools and information resulting from the administration of projects. It can also participate in the selection, management, and relocation of shared and project personnel since its mission is to provide all the necessary support in project management and ensure that projects are executed in line with the company's strategies.

The Project Management Office can also provide internal consulting or services in all aspects of the organization where project management skills are required.

2.5.1. Type of Project Management Office PMO

Depending on the projects' degree of influence and control, there are different types and variants of a PMO. The role played by the PMO can be to:

- Supportive: A supportive PMO exercises a consulting role in projects by providing templates, collecting best practices, giving training, access to information and lessons learned from other projects. Under this form, the degree of control provided by the PMO is low.

- Controlling: The Controlling PMOs, in addition to providing support, ensure compliance by various means. Compliance involves verifying that methodologies are being used, verifying the use of templates and tools, and other governance mechanisms. The degree of control provided is medium.

- Directive: This type of PMO assumes the direct direction and control of the projects. The degree of control provided is high (PMI, 2017)

According to Gartner (Pettey, 2019), there are four different types of PMO:

- Activist PMO are the ones that take a broad view and enabling approach as opposed to a controlling approach, supports decision-makers, and analyze the business cases for alignment and risk point of view (Pettey, 2019)

- Delivery PMO, are the PMO in charge of planning and controlling the tactical execution of the projects by been aligned to the business expectations; the PM are encouraged to be proactive in making decisions (Pettey, 2019)

- Compliance PMO, this PMO has an inconsistence and lack of methodologies, documentation, procedures, templates, this PMO tends to establish the standard practices (Pettey, 2019)

- Centralized PMI is a PMO formed as a place when new people can be hired to the company to get the project word done property, representatives from the various project

support organizations get together to share their practices in a best-practices council (Pettey, 2019)

2.5.2. PMO Frameworks

According to the PMI (2013), there are different profiles for the PMOs according to their functions and situations; for instance, there are five PMO frameworks:

- Organizational Unit PMO/Business Unit PMO/Divisional PMO/Departmental PMO provides project-related services to support a business unit or division within an organization; their activities included portfolio management, governance, operational project support and human resources utilization.
- Project-Specific PMO/Project Office/Program Office provides project-related services as a temporary entity established to support a specific project or program. This PMO may include supporting data management, coordination of governance and reporting, and administrative activities to support the project or program team.
- Project Support/Services/Controls Office or PMO enables processes to continuously support the management of the project, program, or portfolio work throughout the organization. Supports the execution and delivery of the project, program or portfolio using the governance, processes, practices, and tools already established in the organization.
- Enterprise/Organization-wide/Strategic/Corporate/Portfolio/Global PMO the highest-level PMO in organizations having one, this PMO is often responsible for the alignment of project and program work to corporate strategy, establishing and ensuring appropriate enterprise governance, and performing portfolio management functions to ensure strategy alignment and benefits realization.
- Center of Excellence/Center of Competency supports project work by equipping the organization with methodologies, standards, and tools to enable project managers to deliver better projects. Increases the organization's capability through good practices and a central point of contact for project managers (n. p.).

The PMI (2013) also indicates the following domains of work related to what the PMO is doing according to their framework (PMI, 2013).

- Standards, Methodologies and Processes

- Project/Program Delivery Management

- Portfolio Management

- Talent Management

- Governance and Performance Management

- Organizational Change Management

- Administration and Support

- Knowledge Management

- Strategic Planning

3. METHODOLOGICAL FRAMEWORK

The methodology of this project includes the type or types of investigation, the techniques and procedures that will be used to carry out the investigation and search for information. It is the "how" the study is carried out to respond to the problem posed.

It can also be said that the set of rules or procedures that are used and depend on the defined ends or objectives. Their purpose is to organize the investigation steps, promote the achievement of coherent results, objective conclusions, and solve problems.

3.1. Information sources

The information sources are all those documents or materials that provide valuable information to the investigation and the proposed solution.

The information sources allow gathering the necessary information to define the strategy required to consolidate the project, in this case, the Project Management Office. The information sources also consider the necessary steps to consolidate the culture, establish processes and tools to be used in the company's projects, define the roles and functions of the people of the project management office, and finally the processes to evaluate the approach of the projects with the strategy of the company.

3.1.1. Primary sources

The Primary sources are all those from which direct information is obtained; it can be said that it is where the information originates. It is also known as first-hand information or from the scene. These sources are people, organizations, events, the natural environment (NCU, 2021).

The primary sources that are going to be used in this project are:

Interviews and questionnaire application to thirty people from the company, head of the departments, project managers, superintendents, residents, and all the people involved in the execution of the project somehow. For this, the personal delivery of the maturity questionnaire was used to explain its objective, clarify concerns regarding the treatment of the collected data, and it was used to collect other types of information that were considered essential for the project.

This work was carried out during June 2021. The results of the maturity model questionnaire can be found in Appendix No. 4.

To achieve the project objectives, the following were used mainly:

3.1.1.1. Application of questionnaires

To evaluate the state of maturity in projects, according to the Harold Kerzner model, seven questionnaires were applied to thirty people within the organization. This questionnaire was delivered personally through the application Forms from Microsoft 365.

3.1.1.2. Interviews

In addition to completing the questionnaire, three additional persons were interviewed to determine their opinions on the project to implement a PMO office in the company and processes carried out during June and July.

3.1.1.3. Analysis of the questionnaires and interviews

The results of the questionnaires were done using tabulation in an Excel sheet where the responses obtained from each of the respondents were consolidated.

Once the results were tabulated, they were analyzed and interpreted, applying deductive and inductive methods, contrasting what was obtained with what was collected in the interviews and with the standards and documents used to prepare the project to implement the PMO office.

The analysis was made for each of the questionnaires highlighting the strengths and weaknesses that the organization presents, and also a global analysis was carried out with which the level of maturity of the organization in terms of project management was determined, results are shown in the chapter of results, which is shown below.

3.1.2. Secondary sources

Secondary sources are all those that offer information on the subject to be investigated, but that is not the source of information or situations, but only refer to them. The main secondary sources for obtaining information are books, magazines, written documents (in general, all printed media), documentaries, newscasts, and the media. (NCU, 2021).

For researches, any of these sources is valid as long as the researcher follows a systematized procedure appropriate to the characteristics of the topic and the objectives, the theoretical framework, the hypotheses, the type of study and the selected design. In research, the greater rigor and demand involved in the study development process, the more accurate and reliable the knowledge generated.

The project will rely on the following secondary sources:

- Books

- Corporate Intranet

- Master´s degree thesis

- Internal documentation of the company

- Books, documents and standards from PMI and other authors.

The summary of the information sources that will be used in this project is presented in *Chart 1*:

Chart 1
Information sources

Objectives	Information sources	
	Primary	**Secondary**
To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.	Interviews and questionnaire application to people involved in the execution of the project, Head departments, and Project managers.	OPM3 model Model Harold Kerzner CMM Model PMBOK Guide (PMI, 2017) PMI standards
To analyze the different PMO types in order to establish the most suitable for the construction company.		PMBOK Guide (PMI, 2017) PMI standards
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.		PMBOK Guide (PMI, 2017) PMI standards

Objectives	Information sources	
	Primary	**Secondary**
To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.		Project Management websites, PM articles and presentations from Project Management offices
To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it, to measure its performance and improve it.		PM books, PMBOK Guide (PMI, 2017), articles and presentations from Project Management offices, PMI Standards

(Source: The author).

3.2. Research methods

The method is the set of steps and stages that an investigation must complete and is applied to various sciences. In other words, the investigation methods are ordered procedures, the steps to be followed to establish the meaning of the facts to achieve the objectives related to the problem posed.

3.2.1. Analytical method

The analytical method allows separating some of the parts of the whole to subject them to independent study to reveal the relationships of all the parts and, in this way, capture the particularities at the origin and in the development of the objective.

This method is equivalent to decomposition and implies an analysis by parts, separating it between the elements that constitute it, sometimes derived from knowledge based on laws.

In this project, a series of analyzes are carried out on all the specific objectives, such as:

- Analysis of the variables to determine the scope of the project.

3.2.2. Deductive method

This method starts from general laws, concepts, or norms to the particular. It comes from formulating general statements to more specific hypotheses that logically fall from the general statements; this method requires logical and systematic research processes.

In the deductive method, logic and general information formulate a possible solution to a given problem. In this proposal, given that an individualized analysis of the vision of the different proposed objectives is required, these methods allow the researcher to know the reality of the research process. ***Chart 2*** shows the research methods used to develop the objectives defined for this project.

Chart 2
Research methods

Objectives	Research methods	
	Analytical method	Deductive method
To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.	This method is used to diagnose the application areas.	From the information defined in the different models and the answered questionnaire, it was determined what the company's maturity level is.
To analyze the different PMO types in order to establish the most suitable for the construction company.	This method is used to document project management processes as well as to monitor and control projects.	According to what was stated by the various PMO Models, it was deduced, according to the characteristics of the Organization, which is the most appropriate type of PMO.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.	This method is used to document the roles and responsibilities of officials in project management.	This method was used to understand the roles and responsibilities of the different types of PMO and the best way to implement them in the company.
To determine the appropriate location of the proposed PMO within the existing management	The analytical method helped with the literature reviews in order to prioritize	From the current structure of the organization and the results of the questionnaires and interviews carried out, it was

Objectives	Research methods	
	Analytical method	Deductive method
structure to prioritize its functions on the management structure.		deduced which is the possible organization structure and where the PMO office would be located.
To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it, to measure its performance and improve it.	This method served as the critical thinking and analytical guide to developing the implementation plan for the	This method helps in the collection of the data for the research. The data is then used to create a new outcome

(Source: The author).

3.3. Tools

They are the specific tools for project management used to achieve the objectives set and meet the requirements. In this proposal, the necessary tools are used to design a Project Management Office. *Chart 3* defines the tools to be used for each proposed objective.

Chart 3
Tools

Objectives	Tools
To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.	Expert judgment Questionnaires and surveys Analytical Technical Meetings Document analysis
To analyze the different PMO types in order to establish the most suitable for the construction company.	Expert judgment Questionnaires and surveys Meetings Analytical techniques

Objectives	Tools
	Document analysis
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.	Organization Theory Organization Charts and Job Descriptions
To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.	Expert judgment Meetings Document analysis
To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it, to measure its performance and improve it.	Stakeholders' analysis PMO research templates Experts' advice and judgment

(Source: The author).

3.4. Assumptions and constraints

An assumption is an object and matter that is not expressed in the proposition but is what the truth of it depends on, or what it consists or is based on. For their part, restrictions are a limiting factor that affects the execution of a project, program, portfolio, or process.

Chart 4 shows the assumptions and constraints and their relationship with the objectives of the project.

Chart 4
Assumptions and constraints

Objectives	Assumptions	Constraints
To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.	The personnel selected to answer the questionnaire have worked with projects inside or outside the company.	The availability of time to answer the questionnaire

Objectives	Assumptions	Constraints
To analyze the different PMO types in order to establish the most suitable for the construction company.	The company is going to implement a PMO	The maturity level of the company
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.	New personnel will be assigned or hired, and the new functions will be adopted according to those specified in the new manual for the PMO.	Modifications in the current functions Manual, which are documents of national order, cannot be changed by the training centers.
To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.	The Board of Directors of the company will approve the proposal to create the PMO and the new proposed Organizational structure.	Time available for the members of the Board of Directors to meet and approve the proposed changes.
To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it, to measure its performance and improve it.	Developing a methodology that would lead to a better return on investment (ROI)	Scope Time

(Source: The author).

3.5. Deliverables

A deliverable is defined as any product, result or ability to provide a unique and verifiable service that must be produced to complete a process, a phase, or a project. *Chart 5* defines the deliverables for each proposed objective.

Chart 5
Deliverables

Objectives	Deliverables
To assess the maturity of the construction company in order to determine the project management strengths, improvement opportunities and needs.	Report of the Organization's Maturity diagnosis, according to the analysis made of the responses obtained from each of the interviewees
To analyze the different PMO types in order to establish the most suitable for the construction company.	Study and analyze the types of PMO and define which is the most applicable to the Corporation.
To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.	Proposal of functions and responsibilities of the PMO and its members prepared according to quality standards and the PMI and the profile of the project manager
To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.	Organizational structure proposal to locate the PMO within the company.
To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it to measure its performance and improve it.	Report of the appropriate methodology, tools, and templates

(Source: The author).

4. RESULTS

This chapter is based on the approach of related activities to fulfill each of the objectives mentioned above, which can be specified sequentially, allowing to define the validation and control of each stage to obtain favorable results and continue with the subsequent phases. This also makes it possible to make the necessary adjustments proposals in the required organizational changes to facilitate an orientation that suits the needs of the PMO implementation.

4.1. Maturity level of the construction company

The evaluation of the maturity level of the construction company in terms of project management was made based on the proposal prepared for didactic purposes by Mr. Manuel Álvarez, MAP (see Appendix 4). This questionnaire evaluates the following aspects:

- Questionnaire No. 1: Level of maturity in project management

- Questionnaire No. 2: Level of methodology in project management

- Questionnaire No. 3: Project management tools

- Questionnaire No. 4: Level of development of competence in project management

- Questionnaire No. 5: Level of methodology in portfolio management

- Questionnaire No. 6: Level of methodology in managing programs and multi-projects

- Questionnaire No. 7: Project management office level

Each question consists of five answer options, and each option is valued with a score ranging from 2 to 10 points, depending on the option chosen, for a maximum total of 600 points if the maximum score is obtained in each of the answers, which allows categorization according to the following scores in *Chart 6*:

Chart 6
Category according to score

Score	Category
0 to 128	Low

Score	Category
128 to 256	Medium low
256 to 384	Medium
384 to 512	Medium high
512 to 600	High

(Source: The author based on the demonstrative exercise of diagnosis of organizational maturity in project management by Mr. Manuel Álvarez, MAP).

To determine the level of maturity in which the organization is, the method established by this methodology is that according to the total of points to be obtained compared to the total of points obtained, a percentage is established, which allows locating the level of maturity according to the classification in *Chart 7*.

Chart 7
Level of maturity and score relation

Levels	Level name	Level %
High	Continuous improvement	81% to 100%
Medium High	Benchmarking	61% to 80%
Medium	Unique methodology	41% to 60%
Medium Low	Common process	21% to 40%
Low	Common language	1% to 20%

(Source: The author based on the demonstrative exercise of diagnosis of organizational maturity in project management by Mr. Manuel Álvarez, MAP).

Thirty people from different departments involved in t project execution were asked to answer the questionnaires, obtain the result shown in Chart 8.

Chart 8
Results of maturity level questionnaire

Questionnaire	**Project management tools**	**Level of maturity in project management**	**Level of methodology in portfolio management**	**Level of methodology in project management**	**Level of development of competence in project management**	**Level of methodology in managing programs and multi-projects**	**Project management office level**
Number of people	30	30	29	28	29	29	0
Maximum score	1800	8700	1740	1680	2030	1450	1500
Minimum score	360	1740	348	336	406	290	0.00
Score	1024	7100	1184	954	1030	1008	0.00
Percentage %	56.89%	81.61%	68.05%	56.79%	50.74%	69.52%	0.00%
Level	Medium	High	Medium-high	Medium	Medium	Medium-high	Low
Harold Kerzner	Unique methodology	Continuous improvement	Benchmarking	Unique methodology	Unique methodology	Benchmarking	Common language
General percentage %	57.66%						
General level	Medium						
Harold Kerzner	Unique methodology						

(Source: The author).

As **Chart 8** shows, the company is at a medium level or unique methodology, with a percentage of 57.66%. The best-qualified area is project management maturity since, within the company, there is already a project management culture where processes or guides used in each process are defined. While the area with the lowest score corresponds to the project management office, since the company does not have a PMO, this category is followed by the level of competence in project management.

Figure 3
Results of the questionnaires
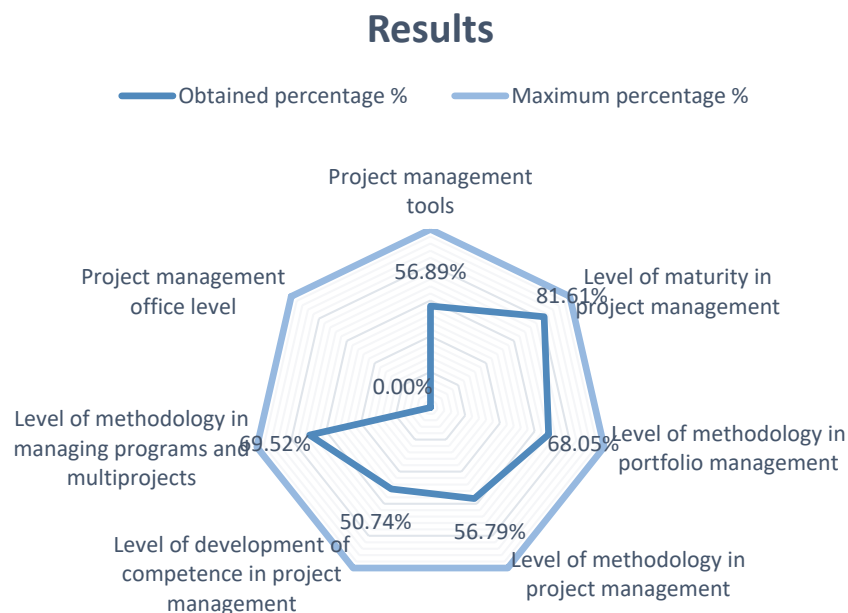
(Source: The author).

4.1.1. Analysis of the questionnaires

Considering the responses given by the group of people to whom the questionnaire was applied, the point in which the best score was obtained was identified to determine the strength of the organization and the lower scores as the aspect that need to be improved.

4.1.1.1. Questionnaire No. 1: Level of maturity in project management

According to the results, most people agree that the company has a high maturity level in project management, being question 11 the one that obtained the lowest score, about risk management techniques in projects, and the question with the highest score was question 5, where it refers to the position of project managers.

4.1.1.1.1. Strengths

- Within the organization, the value of projects is recognized and how they form part of the organization's general objectives and strategies.

- The value of the projects for the organization is evaluated and considered when selecting them.

- The projects have clear and measurable objectives and time, cost, and quality, in most cases.

- The role of the project manager is identified for most projects

4.1.1.1.2. Weaknesses

- Failure to use risk management techniques to measure and evaluate the impact of risk during project execution.

- Small effort is made to effectively consider workload, profit or margin requirements, and time limits in deciding the amount of work you can undertake.

- Small effort is made to evaluate the viability of the project plans in terms of their schedule, dependencies with other projects and availability of resources.

- Partially, the organization incorporates lessons learned from previous projects, programs, and portfolios into the project management methodology.

4.1.1.2. Questionnaire No. 2: Level of methodology in project management

In terms of methodology in project management, the level obtained was medium. The first question related to standardized methodology was the one that obtained the lowest result with 112 points.

The question with the highest score is question number 4 regarding the approval of the plans project.

4.1.1.2.1. Strengths

- Metrics are established to calculate Key Performance Indicators (KPIs) regarding scope, time, cost, quality, acquisitions, communication, and human resources.

- Changes in the project baseline are analyzed

4.1.1.2.2. Weaknesses

- There is not a unique project management methodology in the company

- Not all those involved in projects consider that project planning follows a standardized methodology that involves all project management knowledge areas.

- Lessons learned and continuous improvement are not managed as a shared database.

- Despite being an organization working on projects for years, the methodological issue has been relegated to having well-defined processes and procedures. However, the culture of Project Management has not been internalized in terms of the standards defined by the PMI and disseminated in the PMBOK Guide (PMI, 2017) that is currently in its seventh edition.

4.1.1.3. Questionnaire No. 3: Project management tools

Regarding the level of maturity in project management tools, the company is at a medium level or unique methodology, according to Kerznez. The question that obtained the lowest score was the one referring to the use of tools such as views and custom templates, while the question with the highest score refers to the software available in at least 80% for the projects.

4.1.1.3.1. Strengths

- At least 80% of the projects have access to licenses of the following software: Excel, Word, PowerPoint, Microsoft 360 and Ms Project. It should be considered to

implement corporate project management tools, corporate database management, and others.

4.1.1.3.2. Weaknesses

* Concerning managing individual projects, portfolios, and multi-projects, there is no fixed standard for Project Management Software Tools, with views and personalized templates for the company.

* About portfolio management, there is a minimum standard for Project Management Software Tools, with views and personalized templates for the company.

* Little distribution and collection of information to all team members, functional or line managers.

4.1.1.4. Questionnaire No. 4: Level of development of competence in project management

According to the questionnaires, it is considered that the level of development of skills in project management is at a medium level of maturity, the question with the lowest score refers to knowledge of the methodology in project management, and the question with the highest score refers to the current state of the skills in project management processes.

4.1.1.4.1. Strengths

* There is a process for developing competence in Project Management at the corporate level that is linked to the performance evaluation process

* There is a process of development of competence in Project Management. There is evidence of use at the corporate level in more than 80% of Portfolio Directors, Program and Project Managers, Team Members and others involved.

4.1.1.4.2. Weaknesses

* In the company, developing competencies in project management is aimed at project managers and not the entire team involved.

- Isolated courses of software tools are authorized for individuals who request it, but there is no continuous or specific training plan.

- There is no standardized process for the development of the performance competence in Project Management

- There is no standardized process for the development of personal competence.

4.1.1.5. Questionnaire No. 5: Level of methodology in portfolio management

The level of methodology in portfolio management is a medium-high level; according to Kerzner, it is in a benchmarking process. The question with the lowest score was related to risk management methodology, and the question with the highest score was related to the prioritization of projects in the company.

4.1.1.5.1. Strengths

- The culture of Project Management within the organization is formally based on policies and procedures, with well-defined roles and responsibilities at the level of team members, project managers, functional managers, sponsors, program or multi-project managers, directors of portfolio and senior executives, in all areas of the organization

- Projects are prioritized based on clients, difficulty, subjective and financial benefits, risk, alignment with strategic objectives, competitive advantage, synergies, and strategic alliances.

4.1.1.5.2. Weaknesses

- The project risk management methodology in the organization is informal.

- In the organization, reviews are done periodically in control points (Quality Gates) established to approve successive phases of the projects. When necessary, at the client's request, a document requiring changes is generated to submit it for evaluation and authorization by the Decision Committee.

4.1.1.6. Questionnaire No. 6: Level of methodology in managing programs and multi-projects

The level of methodology in the program and multi-project management is in the benchmarking stage. The question with the lowest score refers to the use of resources in the organization, and the question with the highest score refers to the metrics used in the development of programs and multi-projects.

4.1.1.6.1. Strengths

- The company identifies, evaluates, and implements improvements for the main processes of program management and multi-projects.

- The company establishes unemployment metrics that involve time, costs, scope, quality, acquisitions, human resources, communication, and risk.

4.1.1.6.2. Weaknesses

- It is not planned based on actual resource limits or constraints, and resources are allocated and sought as projects are authorized

- The availability of strategic resources and priorities are reviewed as the schedule for their authorization is detailed.

4.1.1.7. Questionnaire No. 7: Project management office level

The questionnaire on a project management office was not carried out since the company does not have a project management office that can be evaluated; however, it has been detected that the company already has knowledge of project management and the Project managers and coordinators are aware of this, but they do not work in an integrated manner.

4.2. Analyze different PMO types and find the most suitable

An analysis of the different types of PMO is required; there are three basic PMO types, as previously mentioned, each PMO is analyzed subsequently.

Supporting: A supporting PMO exercises a consulting role on projects in the form of templates, best practices, training, access to information, and lessons learned from other projects. Under this form, the degree of control provided by the PMO is low.

Controlling: In addition to providing support, the Controlling PMO ensures compliance by various means. Compliance involves verifying that methodologies are being used, verifying the use of templates and tools, and other governance mechanisms. The degree of control provided is medium.

Directing: The PMO assumes direct management and control of the projects. The degree of control provided is high.

Based on the information collected in the questionnaires and knowledge of the company, the company requires a hybrid PMO. According to the questionnaires, some of the processes have a clear idea and process of how to be done, while others have no experience and practice, so the functions of the PMO will change according to the process and the project.

Furthermore, the PMO will apply effective practices for each project. For a while, the PMO will be a standard PMO established and monitor the projects using a complete project management methodology. It will provide full life cycle coverage, integrate technical processes, and conduct methodology user training. After the proof time, the PMI can advance to an advanced PMO or change to a basic PMO according to its performance.

There are five different states (Hill, 2008):

State 1: Office of projects is focused on complying with the triple restriction: scope, time, and cost. This PMO is in charge of a few projects and is made up of a project manager and an assistant. In a short time, positive experiences will facilitate your migration to the next state.

State 2: Basic PMO, when a standard methodology is established and is used in all projects. Now multiple projects are working, and there are several project managers attached.

State 3: Standard PMO when infrastructure is established to support and govern a complex project environment. Multiple projects are handled that can be complex. It has a program manager and multiple project managers.

State 4: Advanced PMO. It is focused on compliance with the organizational strategy. Multiple programs are working, and their portfolio manager may be included to serve as a director. Program managers and project managers work full-time.

State 5: Center of excellence, continuous improvement is implemented and observed by all members of the office and by users, both in terms of strategy and tactics.

4.2.1. PMO according to the PMO Framework

The PMO that best suit the company is an organizational unit PMO, where they provide project-related services to support the unit; it can also be considered that the PMO is a project support office because it provides continuous support to the projects, programs, and portfolio, using the organization resources and tools.

The organization unit's primary functions and support PMO will perform are scope, cost, schedule, communications, resources and risk management of the projects and programs, guidelines in methodology, process development and improvement, and metrics definitions. The PMO will offer portfolio reporting, periodization, and resources management to the portfolio.

The main indicators in these types of PMO are project delivery vs. schedule evaluations, customer feedback evaluations, project cost against budget evaluation, formal evaluations of project managers, and formal evaluation of the PMO team.

The organizational unit PMO supports the organizational unit strategy by providing PMO services, including portfolio management, governance, operational, and project support to a specific organizational unit. The Project support office provides enabling processes to support the management of projects, programs, or portfolio work; it utilizes the governance, processes, best practices, and tools established by the organization and provides administrative support for the delivery of the project, program, and portfolio work within its domain.

The domains of work are the definition of methodologies, the definition of indicators, development and improvement of processes, the definition of the business objectives, resource, program, and cost and scope management.

4.3. Roles and responsibilities of the PMO

As the model of the combination of the types of project management office is proposed, it must aim at the following spheres of action:

- The PMO office will be in charge of establishing methodologies, methods, procedures, management tools (such as templates) and control of projects in terms of time and costs, establishing quality and performance metrics, both for internal and external projects

- Advice and train people in institutional project management methodology.

- Support in the management of all projects by areas or technological lines. The PMO will control the portfolio of programs and projects that the organization is executing, internally and externally.

- Assume a leading role in projects.

- Formalize reviews of projects.

- Inform the directive committee of the company about the status of the projects.

- Take corrective actions; this implies having a baseline and making corrections, continuously providing feedback.

- Consistently manage projects based on the execution process of comprehensive professional training, generating an assurance in the quality of training and allowing it to transcend to productive projects or business plans.

- Provide support to the executive management in the strategic evaluation of the projects and programs to be executed to guarantee the achievement of the strategic organizational objectives.

Some of the templates the PMO has to provide to the projects are:

- Project charter with a clear vision of the project and articulate the objectives and goals of the project to all its stakeholders.

- Project plan, with detailed schedules of activities, resources, time, and the deliverables of the project

- Governance plan, this template will establish how decisions will be made on the project, roles, and responsibilities to be assigned to each member of the project team

- WBS, work breakdown structure with the specific deliverables due from each team member at each project stage.

- Risk analysis identification to list as many potential risks or problems that have a probability of occurrence create impact and possible mitigation.

The PMO office will carry out these functions in the medium term, depending on the results obtained and the convenience of adjusting the initially established model.

4.3.1. PMO chief profile

The PMO chief will be part of the Project Management Office and report directly to the CEO and president of the company. This position's corporate competencies are social commitment, initiative, flexibility, customer orientation, leadership, strategic orientation, and construction of networks.

His educational background must be professional in engineering, architecture or disciplines related to construction, with a specialization in project management, must know about project management, strategic planning, management of indicators and monitoring and measurement mechanisms, process management, MS Office package including MS Project, preferable speak English (level B2).

At least five years of experience in a PMO position and at least one year of experience in a management position with staff in charge. Demonstrated experience in managing MS Project, a complete understanding of financial reports (Balance Sheet, income statement) and reporting experience.

4.3.2. Roles and responsibilities of a project manager

The role of a project manager is to understand, improve and support the functionality, integration and business processes until the project is delivered.

The project manager is responsible for the coordination and integration of activities across multiple functional lines. For this, the project manager needs to develop communication and interpersonal relationships skills, become familiar with the operations of each line of organization and have general knowledge about the technology used. The project manager is responsible for the motivation and stimulation of the people to achieve high-performance levels and overcome obstacles arising from changes.

The project manager's professional studies must cover areas related to construction and have a postgraduate degree in Project Management or project manager credentials such as PMP (Project management professional from the PMI) and intermediate level of English (level B2).

4.3.3. Roles and responsibilities of a member of the PMO

The results of the information-gathering techniques and general considerations were taken as a reference to determine later the activities that the project team will carry out in the role of instructors and define what type of skills they will be necessary to achieve the objectives of the project (s) they are in charge of. Then, when selecting each member, their experience, knowledge, and ability to establish interpersonal relationships, training program knowledge, and skills should be considered. Only once these issues are resolved can the optimal size of the team and its members be determined.

Chart 9
PMO roles and responsibilities

Responsibility	Role	Approver
Establish project methodologies, project charter	Project executive and manager	Project sponsor
Create work plan	Project manager	Project executive
Governance plans	Project manager	Project executive
WBS	Project manager	Project executive
Communication plan	Project manager	Project executive

Responsibility	Role	Approver
Project tracking, project status information, analyzing data, corrective actions	Project manager	Project executive PMO
Project support, centralized information, analyze project development	Project executive PMO	Project executive

(Source: The author).

4.3.4. Functions of the PMO

Different authors have identified the PMO functions; for instance, Christine Dai (2002) considerer that developing and maintaining the standards, methods, and historical version is one of these functions.

Hobbs and Aubrey (2007) consider the functions as part of the analysis, dividing the functions in monitoring and controlling Project performance, development Project management competencies and methodology, multi-project management, strategic management, and organizational learning.

The research done by Hobbs and Aubrey (2007) identified that the group of functions associated with monitoring and controlling of project performance was the essential function, followed by the development of project management competencies and methodologies, as a result of the research done by them in multiple PMOs there are 27 functions, and are the following (Ferreira, 2019):

- Manage project or program benefits

- Support project portfolio definition

- Provide project management methodology

- Manage lessons learned database

- Manage project documentation

- Provide project management tools and information systems

- Monitor portfolio performance

- Manage resource allocation between projects

- Participate in strategic planning

- Promote project management within the organization

- Provide advice to upper management in decision making

- Provide training and project competency development

- Support project planning

- Perform benchmarking

- Provide mentoring for project managers

- Conduct audit in projects

- Manage organizational changes

- Manage stakeholders in projects

- Manage projects or programs

- Provide project or program performance report to upper management

- Manage people in projects

- Monitor and control project performance

- Provide a strategic project scoreboard

- Manage interface with project clients

- Manage lessons learned meetings

- Execute specialized tasks for project managers

4.4. Organizational structure with the proposed PMO

4.4.1. Mission

Contribute so that the objectives of the projects are formulated and developed efficiently and effectively with the alignment of the institutional mission.

4.4.2. Vision

To be the area in accompaniment and management of projects, which allows implementing processes and procedures with innovation and control in projects in one year from the implementation of the PMO.

4.4.3. Organization structure

The PMO office would be at the department level, as *Figure 4* shows. It would lead the project management issue and interact with each of the areas of the organization with which it needs, maintaining a matrix-type organization structure.

Within the established, initially, the PMO office will be made up of the current project managers. As the implementation of the office progresses, more personnel will be incorporated to help with project management and analysis.

The proposed organization structure was considered to promote the figure of the Project Manager, with skills and abilities to lead projects, oriented to the execution of projects, implement the Project Management methodology, integrated with each area or department, and train and transmit the knowledge of the institutional methodology to the users.

Figure 4
Organizational structure with the PMO
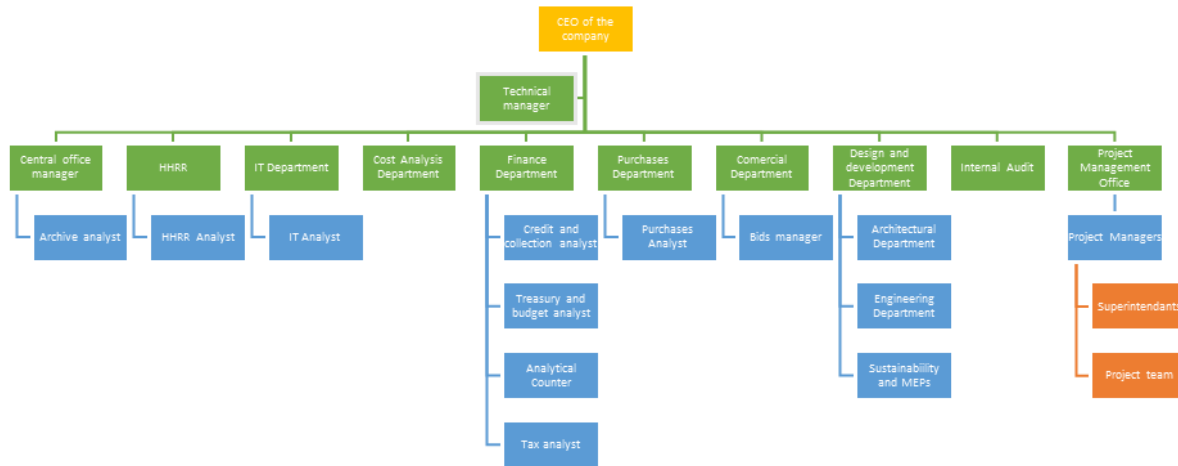
(Source: The author).

4.5. PMO implementation plan

The implementation and assembly of a PMO in any organization is a project itself, and as such, has a before, during and after. The before is due to the feasibility study that must be carried out to evaluate its suitability or not. Although the convenience of having a PMO in organizations is not discussed, the Organization must prepare to have a project management office as a previous step and initial before deciding to create it. During this period, it will be the time of assembly and start-up of the office. The after will correspond to a stage of control, monitoring, evaluation, validation, and adjustment of the adopted maturity model. The Corporation must advance to achieve excellence in projects; in terms of the Kerzner model, it achieves the last level of maturity described as continuous improvement.

Before describing the steps for establishing a PMO, the organization must carry out an inventory and characterization of the resources available in the organization and the state of maturity with which the projects are managed.

According to PM Majik (PM Majik, 2021), these are the following steps for the implementation of a PMO:

1. Define the objectives of the PMO

2. PMO Sponsor

3. Define the PMO tools, processes, and functions

4. PMO organization, roles, and responsibilities

5. Engaged and communication

6. Monthly PMO routines

7. PMO charter

It is essential to consider the resources (human and technical), budget for operation, and the initiation of the cultural change and knowledge management that allow the organization to start up the PMO office must be defined.

As recommendation is suitable to elect a leader to direct the process, who must be in charge of the team defined to accompany him in developing activities. Among them, determining the time required for implementation, having the staff available, the approved budget, leading the team, reporting to senior management. A person who is linked to the company and who has the strengths and experience in project management.

4.5.1. Stakeholders' analysis

The implementation of the PMO office in the Company involve 13 people directly; these people are the CEO, the department chief and the current project management. These identified stakeholders were rated according to their degree of power, influence, and interest in the PMO office implementation project. Qualified attributes definitions or characteristics are shown in *Chart 10*

Chart 10
Definitions or characteristics of the attributes of stakeholders

Attribute	Definition
Interest	Degree of acceptance manifested by the Involved Actor towards the Project
Power	Degree of decision that the Involved Actor has regarding the project

Attribute	Definition
Influence	Degree of motivation generated in others by the Actor Involved in the Project

(Source: The author).

According to PMI recommendations (PMI, 2013), stakeholders in the project can be classified into four different strategic categories:

- Quadrant in which the actors have a high level of power and a high level of interest. The actors located in this quadrant must be managed very carefully.

- Quadrant in which the actors have a high level of power and a low level of interest. The actors located in this quadrant must be kept satisfied, that is, with a lot of attention.

- Quadrant in which the actors have a low level of power and a high level of interest. The actors located in this quadrant must be managed by mitigating their doubts and fears, and they must be kept informed.

- Quadrant in which the actors have a low level of power and a low level of interest. The actors in this quadrant do not generate problems and, therefore, should be monitored if they change category.

Figure 5 shows the matrix of power interest of the company based on the organizational structure.

Figure 5
Matrix power interest of the company
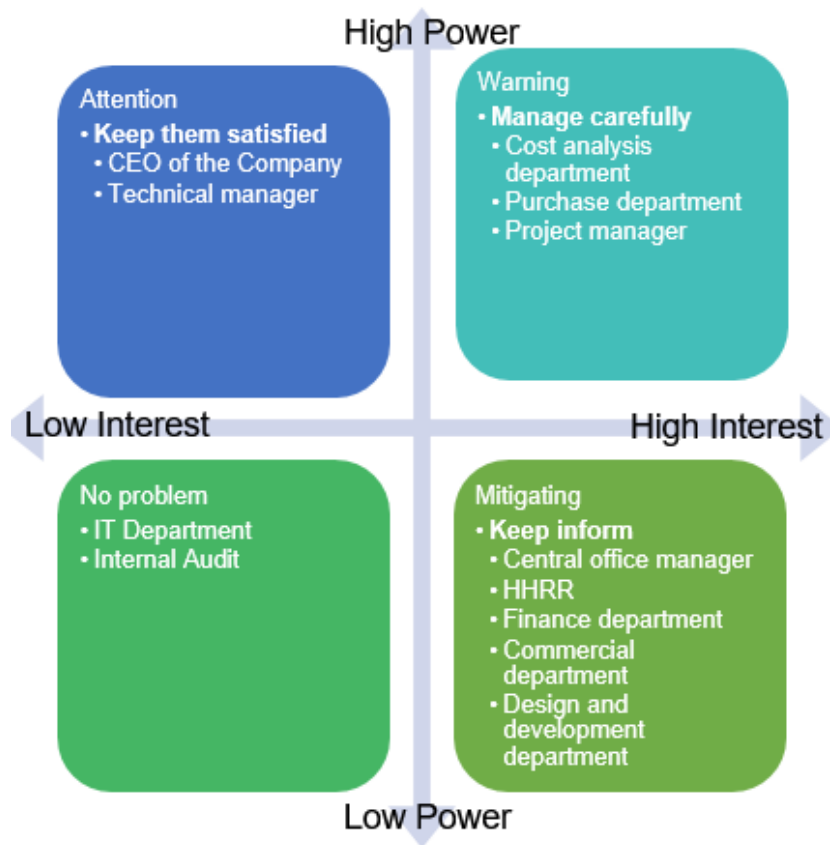
(Source: The author).

4.5.2. Key Performance Indicators

The PMO key performance indicator should demonstrate that the PMO has achieved its goals and improved the project management process. Some KPI can be the following (Holicky, 2020):

- Percentage of the project completed: How many projects are completed versus how many projects the organization planned initially; the correct indicator will be 100%; however, it is acceptable from 85% to 100%, other results will indicate the PMO is failing.

- Percentage of the project delivered aligned with the company's mission, vision, and strategy: Consider how many strategically important projects or projects most highly aligned to the corporate strategy were completed. The correct indicator is 100%. The

acceptable criteria is from 95% to 100%; since all the projects must be aligned to the company, some special projects may not be in this category.

- Percentage of the project completed on time: How many projects are completed on time versus how many projects the organization completed; the correct indicator must be 100%, acceptable criteria is 80% to 100%, mining that from ten projects, two are delay due to different circumstances that may not be considered in the risk management plan of the project.

- Percentage of Completed Projects within Budget: PMOs should facilitate planning and execution to ensure projects are completed within their budget. The percentage of completed projects within budget compared over previous periods can be an extremely powerful success metric. The same criteria of acceptance from the percentage of projects completed on time.

- Percentage of projects stopped or failed: A comparison of the projects stopped temporary or failed versus all the company's projects. The ideal criteria will be 0%; however, projects can fail for different reasons that were not contemplated, so this criterion is acceptable from 0% to 20%. If the indicator is above 20%, the PMO is not working well in executing and revising the projects.

- Resource Utilization Rate: How much employee capacity is planned or used on projects. If the resource utilization rate is over 100%, then you have employees working overtime. If the rate is well below 100%, some employees have extra time on their hands. It is essential to have a reasonable resource utilization rate (between 80% and 100%) because over-allocated resources can cause project delays and increased budgets while under-allocated resources are not being utilized efficiently, and opportunity is there for them to better contribute to company growth.

- Level of Satisfaction: The PMO is meant to alleviate frustrations. This means resolving resource conflicts so employees are not over-allocated, helping upper management understand the tradeoffs of approving specific projects and removing roadblocks for project teams so they can do their job.

4.5.3. Risk management

The company must identify the risk to efficiently manage their work and minimize their impact within the project. Their strategic plans can be fulfilled with a high degree of certainty, and that the existing degree of uncertainty can be established, quantified, and managed correctly.

Likewise, each level of the maturity model has implicit risks, which can be classified as low, medium, and high, according to the level of impact that the change in the corporate culture can have

Low risk: there is virtually no impact on the company culture, or the company culture is dynamic and readily accepts change.

Medium risk: the organization recognizes that the change is necessary but may not be aware of its impact. Instituting a multi-boss reporting system could be an example of carrying medium risk.

High risk: high risk can occur when the organization recognizes that the changes resulting from the implementation of project management will cause a change in the corporate culture. Examples include the creation of project management methodologies, policies, and procedures and the decentralization of authority and decision-making.

Level 3 of the maturity model of Kerzner has the highest risk and degree of difficulty for the organization. Once the company has committed to level 3, the time and effort required to reach higher maturity levels are less challenging. However, reaching level 3 requires a significant change in corporate culture.

It is necessary to know the risks and design strategies so as not to be affected by them and allow efficient management of your activities, facilitating:

- Adequate identification of risks allows the achievement of the project scope within the time, cost, and quality programmed.

- Knowing that there are controllable and uncontrollable risks within a project allows adequate programming and calculation of contingency reserves and project management.

- Identifying the risks and at what stage they may occur allows dedicating the necessary efforts to minimize their impact in that stage and subsequent ones to benefit the project's objectives.

- Knowing the risks of the project allows anticipating the possible paths or routes to follow in order to avoid negative impacts and at the same time take advantage of the opportunities that arise.

It is proposed to use software such as risk, risk simulator, crystal ball, risky project, among others, which allow integration with other software such as MS Project to make a more adequate and efficient management of the risks of the projects. Using these tools, the PMO Office can evaluate and control their risks and provide support and help to those in charge of executing the projects in this matter.

5. CONCLUSIONS

1. The company is in a unique methodology process, in which specific processes are standardized and certain processes are managed informally; in addition, not all those involved in the development of projects know the processes, procedures, tools and techniques and are aligned to the PMBOK Guide (PMI, 2017).

2. According to the information collected, the most appropriate project management office will be a hybrid model, giving support and control according to the project and the project team. The PMO most suitable framework is a combination of an organizational and support unit

3. The organizational changes aim to strengthen the project management issue, both operational and strategic.

4. The company project management office will allow channeling one of the most valuable assets that the organization has, such as knowledge. The PMO can have an inventory and centralized management of the lessons learned in the execution of projects.

5. The implementation of the PMO will help reduce the risk and uncertainty of the projects, also have the same methodology and way of manage a project by applying the templates, tools and knowledge that the office will have.

6. In long term (in a period of a year) the company will have the percentage of the projects complete, by using this indicator well the company can know in a medium term the aspects that make the projects fail or fail to be carried out correctly.

7. The company project management office indicator resource utilization rate, will allow the company know the fulfillment of the activities of the project team, also check if the hired people is enough, and be able to optimize human resources in short term.

8. The level of satisfaction of the clients allows the company to take immediate action and improve their services and products

6. RECOMMENDATIONS

1. The company should support the creation of a project management office to provide all support with good practices in managing training projects due to the difficulties that currently arise in the execution of projects.

2. Guide the staff of the company in the implementation of the project training methodology applying the PMI standard to comply with the institutional guidelines

3. The organization shall support the formation of the project management team with a project manager that allows to control the projects and follow up in each phase with the project team

4. HHRR should develop courses for the Project Manager and support staff in project formulation and management

5. Implement the PMI standards of project management adjusted to the company projects or for all projects and ensure a flexible discipline in its compliance and train all those who have to participate in the project culture.

6. The company should provide technological tools that allow adequate risk management in projects to predict possible impacts in terms of cost and time.

7. Define a system of indicators and metrics for the PMO and the company's projects to gradually implement the project management culture.

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8. APPENDICES

Appendix 1: FGP Charter

<table>
<tr><td colspan="2" align="center">PROJECT CHARTER
Formalizes the project start and confers the project manager with the authority to assign company resources to the project activities. Benefits: it provides a clear start and well-defined project boundaries</td></tr>
<tr><td>Date</td><td>Project Name:</td></tr>
<tr><td>May 16,2021</td><td>Implementation of a Project Management Office (PMO) in a construction company in Ecuador</td></tr>
<tr><td>Knowledge Areas / Processes</td><td>Application Area (Sector / Activity)</td></tr>
<tr><td>Knowledge areas:
Project Integration Management
Scope Management
Time Management
Cost Management
Quality Management
Human Resource Management
Communication Management
Risk Management
Procurement Management
Stakeholder Management
Process groups: Initiation and Planning</td><td>Construction
Civil Engineering</td></tr>
<tr><td>Start date</td><td>Finish date</td></tr>
<tr><td>July 19, 2021</td><td>October 15, 2021</td></tr>
<tr><td colspan="2">Project Objectives (general and specific)</td></tr>
<tr><td colspan="2">General Objective:
To implement a Project Management Office (PMO) for a construction company to maximize and optimize the results of the projects done by the company.
Specific Objective:</td></tr>
</table>

1. To assess the maturity of the construction company to determine the project management strengths, improvement opportunities and needs.

2. To analyze the different PMO types in order to establish the most suitable for the construction company.

3. To propose the roles and responsibilities to be assigned to the PMO in order to evaluate its efficiency.

4. To determine the appropriate location of the proposed PMO within the existing management structure to prioritize its functions on the management structure.

5. To propose a PMO implementation plan for the construction company, including the sequence of main steps required to achieve it to measure its performance and improve it.

Project purpose or justification (merit and expected results)

The project will be based on one of the largest construction companies in Ecuador; due to internal politics and conflicts of interest, the company's name will remain anonymous.

The company has been in the construction market for more than 60 years and has always been a pioneer in implementing new processes or requirements that benefit the company and the client; however, it does not have a Project Management Office (PMO) which give institutional guidelines clear, and of support or control to the projects that the company has.

The lack of a project office means that projects do not have a common language in their execution, the project managers do not always follow the PMBOK Guide (PMI, 2017) guidelines, which causes projects to have problems in different areas, such as cost, time, or scope, and eventually, this will affect the company.

The implementation of a Project Management Office (PMO) will allow the projects to manage a common language between them, the control of time, costs and scope will be of general knowledge among all those involved, information can be collected from each project for future needs and all the projects will be aligned with the PMBOK Guide (PMI, 2017) knowledge areas

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

Project Charter

Maturity analysis of the company

Project management plan

Scope management plan for the creation of the PMO

Time management plan for the activities, their duration and control mechanisms

Cost management plan to determine the project budget and its controls.

Quality management plan to ensure the quality of the project

Human resources management plan to establish the requirements, needs, profiles and hiring of the project's human resources

Roles and responsibilities to be assigned to the PMO as well as its location on the hierarchy of the company organizational management

Communication management plan for the proper management of the project communications and documents
Risk management plan to identify and manage the risks
Procurement management plan to carry out the required acquisitions for the project
Stakeholders' management plan to know their interests and expectations in the project
PMO Application documents for managing construction companies, especially the ones in Ecuador.

Assumptions

It is assumed that this project would be developed using experiences, data, and information gathered from the company, a Construction Company in Ecuador, to further this project.

Have enough money, and it is available when required

There is the time and facilities to carry out the activities required to prepare the project

Constraints

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

Resources constraints, there will be just one person developing the project

Preliminary risks

If permission and access to the required information is hindered in any way during the research period, that might impact the delivery time and subsequent quality of the project

Not having sufficient economic, human, and technological resources at the required time can generate delays in the project, cost overruns or redefinition of the scope, affecting the required quality.

The organizational restructuring that facilitates the execution of the roadmap for creating the PMO is not approved.

Budget

$1500, related to three months of work for human resources

$500 for office resources.

Milestones and dates

Milestone	Start date	End date
Project charter	May 10, 2021	May 16, 2021
Introduction chapter	May 17, 2021	May 24, 2021

Theoretical Framework	May 25, 2021	May 30, 2021
Methodological Framework	May 31, 2021	June 6, 2021
Final graduation project start	July 19, 2021	October 15, 2021
Graduation seminar	October 15, 2021	October 15, 2021

Relevant historical information
The construction company has more than 60 years in the market, is one of the biggest and leader companies in Ecuador in the construction field, have different departments such as finance, design, RRHH, and have three project managers; however, they do not belong to any department, and there is not a project management office to control and support all the projects. Last year the construction company became part of a business group, in which there are mining, electrical, maintenance, and real estate companies; however, these sister companies do not have a project management office for which this project will be the pioneer and the guide for other companies.
The company itself uses the PMBOK Guide (PMI, 2017) guidelines but in an informal way and depending on the project manager. Finally, the company also implemented agile tools such as Scrum, where each project develops a sprint for specific cases.

Stakeholders
Direct stakeholders:
Executive Directorate
Directors of the company
Head of Human Talent
Head and staff of the logistics area
Leaders of training, specialized advice, and business creation
Project managers
Area directors
Head of Innovation
Consultants and analysts of the Corporation
Personnel hired to work on the projects (superintendents, residents, subcontractors, among others)
Project Sponsors
Beneficiaries of the Projects
Indirect stakeholders:
Relatives of the beneficiaries of the projects
Suppliers of materials, supplies and equipment

Project manager:	Signature
María Cristina Ávalos Aguilar	
Authorized by:	Signature:

Appendix 2: FGP WBS

1 Project Final Graduation Project

1.1 Graduation seminar

1.1.1 FGP Deliverables

1.1.2 Graduation Seminar approval

1.1.1.1 Charter

1.1.1.4 Chapter II. Theorical Framework

1.1.1.2 WBS

1.1.1.5 Chapter III. Methodological framework

1.1.1.3 Chapter I. Introduction

1.1.1.6 Annexes

1.1.1.6.1 Bibliography

1.1.1.6.2 Schedule

1.2 Tutorial process

1.2.1 Tutor

1.2.2 Development

1.2.1.1 Assigment

1.2.2.1 Adjustments of previous chapters (if needed)

1.2.2.3 Chapter V. Conclusions

1.2.1.2 Communication

1.2.2.4 Chapter VI. Recomendations

1.2.2.2 Charter IV Development (Results)

1.3 Reading by reviewers

1.3.1 Reviewers assigments request

1.3.2 Reviewers work

1.3.2.1 Reviewer 1

1.3.2.2 Reviewer 2

1.3.1.1 Assigment of two reviewers

1.3.2.1.1 FGP reading

1.3.2.1.2 Reader 1 report

1.3.2.2.1 FGP reading

1.3.2.2.2 Reader 2 report

1.3.1.2 Communication

1.3.1.3 FGP submission to reviewers

1.4 Adjustments

1.4.1 Report for viewers

1.4.2 FGP update

1.4.3 Second review by reviewers

1.5 Defense to Board of Examiners

1.5.1 Final review by board

1.5.2 FGP grade report

Appendix 3: FGP Schedule

Id	Modo de	Nombre de tarea	Duración	Comienzo	Fin	Predecesoras
1		1.Project Final Graduation Project	115 días	lun 10/05/21	vie 15/10/21	
2		1.1 Graduation seminar	25 días	lun 10/05/21	vie 11/06/21	
3		Start of the graduation seminar	0 días	lun 10/05/21	lun 10/05/21	
4		1.1.1 FGP Deliverables	25 días	lun 10/05/21	vie 11/06/21	3
5		1.1.1.1 Charter	5 días	lun 10/05/21	vie 14/05/21	3
6		1.1.1.2 WBS	5 días	lun 10/05/21	vie 14/05/21	5CC
7		1.1.1.3 Chapter I. Introduction	5 días	lun 17/05/21	vie 21/05/21	5,6
8		1.1.1.4 Chapter II. Theorical Framework	5 días	lun 24/05/21	vie 28/05/21	7
9		1.1.1.5 Chapter III. Methodological framework	5 días	lun 31/05/21	vie 04/06/21	8
10		1.1.1.6 Annexes	20 días	lun 17/05/21	vie 11/06/21	3
11		1.1.1.6.1 Bibliography	20 días	lun 17/05/21	vie 11/06/21	7CC,9FF
12		1.1.1.6.2 Schedule	5 días	lun 17/05/21	vie 21/05/21	7CC
13		1.1.2 Graduation Seminar approval	0 días	vie 11/06/21	vie 11/06/21	10
14		End of the graduation seminar	0 días	vie 11/06/21	vie 11/06/21	13
15		1.2 Tutorial process	23 días	lun 19/07/21	mié 18/08/21	14FC+25 días
16		1.2.1 Tutor	3 días	lun 19/07/21	mié 21/07/21	
17		1.2.1.1 Assigment	3 días	lun 19/07/21	mié 21/07/21	
18		1.2.1.2 Communication	3 días	lun 19/07/21	mié 21/07/21	17CC
19		1.2.2 Development	20 días	jue 22/07/21	mié 18/08/21	16
20		1.2.2.1 Adjustments of previous chapters (if needed)	5 días	jue 22/07/21	mié 28/07/21	16
21		1.2.2.2 Charter IV Development (Results)	5 días	jue 29/07/21	mié 04/08/21	20
22		1.2.2.3 Chapter V. Conclusions	5 días	jue 05/08/21	mié 11/08/21	21
23		1.2.2.4 Chapter VI. Recomendations	5 días	jue 12/08/21	mié 18/08/21	22
24		1.3 Reading by reviewers	16 días	jue 19/08/21	jue 09/09/21	15
25		1.3.1 Reviewers assigments request	5 días	jue 19/08/21	mié 25/08/21	
26		1.3.1.1 Assigment of two reviewers	2 días	jue 19/08/21	vie 20/08/21	
27		1.3.1.2 Communication	2 días	lun 23/08/21	mar 24/08/21	26
28		1.3.1.3 FGP submission to reviewers	1 día	mié 25/08/21	mié 25/08/21	27
29		1.3.2 Reviewers work	11 días	jue 26/08/21	jue 09/09/21	28
30		1.3.2.1 Reviewer 1	11 días	jue 26/08/21	jue 09/09/21	
31		1.3.2.1.1 FGP reading	10 días	jue 26/08/21	mié 08/09/21	28
32		1.3.2.1.2 Reader 1 report	1 día	jue 09/09/21	jue 09/09/21	31
33		1.3.2.2 Reviewer 2	11 días	jue 26/08/21	jue 09/09/21	
34		1.3.2.2.1 FGP reading	10 días	jue 26/08/21	mié 08/09/21	28
35		1.3.2.2.2 Reader 1 report	1 día	jue 09/09/21	jue 09/09/21	34
36		1.4 Adjustments	21 días	vie 10/09/21	vie 08/10/21	24
37		1.4.1 Report for viewers	10 días	vie 10/09/21	jue 23/09/21	35,32
38		1.4.2 FGP update	1 día	vie 24/09/21	vie 24/09/21	37
39		1.4.3 Second review by reviewers	10 días	lun 27/09/21	vie 08/10/21	38
40		1.5 Defense to Board of Examiners	5 días	lun 11/10/21	vie 15/10/21	36
41		1.5.1 Final review by board	2 días	lun 11/10/21	mar 12/10/21	39
42		1.5.2 FGP grade report	3 días	mié 13/10/21	vie 15/10/21	41
43		Final approval for FGP	0 días	vie 15/10/21	vie 15/10/21	42

Proyecto: CRONOGRAMA FER.
Fecha: dom 23/05/21

Tarea	Resumen del proyecto	Tarea manual	solo el comienzo	Fecha límite
División	Tarea inactiva	solo duración	solo fin	Progreso
Hito	Hito inactiva	Informe de resumen manual	Tareas externas	Progreso manual
Resumen	Resumen inactiva	Resumen manual	Hito externa	

Appendix 4: Questionnaires

EJERCICIO DEMOSTRATIVO DE DIAGNÓSTICO DE MADUREZ ORGANIZACIONAL
EN GESTIÓN DE PROYECTOS

Propuesta elaborada con fines didácticos por el Lic. Manuel Álvarez, MAP

Ejercicio.

Instrucciones generales para la calificación:

a. Marque una opción de cada pregunta y llene la casilla correspondiente con el puntaje promedio
obtenido de todas las encuestas realizadas, luego sume verticalmente el puntaje obtenido por cada
ejercicio y por último sume horizontalmente el puntaje total de todos los ejercicios, obteniendo un
rango de puntaje y su correspondiente nivel.

Puntos por respuesta.

a. 2 puntos.

b. 4 puntos.

c. 6 puntos.

d. 8 puntos.

e. 10 puntos.

Rangos y Nivel.

_ De 0 a 213 = Bajo.

_ De 214 a 320 = Medio Bajo.

_ De 321 a 426 = Medio Alto.

_ De 427 a 640 = Alto.

b. Para el redondeo de los promedios que deben usar en el cuadro Excel, que luego resultará en el
gráfico se aplican las siguientes reglas:

i. Si el puntaje es menor a 0.5, se redondea hacia abajo. Por ejemplo 3.4 redondea a 3.

ii. Si el puntaje es mayor a 0.5 redondea hacia arriba. Por ejemplo 1.6 redondea a 2.

iii. Si el puntaje es igual a 0.5 entonces hay dos posibilidades siguiendo el criterio de REDONDEO AL PAR. Por ejemplo, si el número anterior es par redondeamos al par, por ejemplo, 6.5 redondea a 6; pero si el número anterior es impar, también redondea al par, por ejemplo, 7.5 redondea a 8.

iv. Esta es una antigua práctica matemática que se utiliza para equilibrar los redondeos, ni todos para arriba, ni todos para abajo, ni a la conveniencia del calculista. Es una regla sencilla y útil.

Ejercicio No. 1

Cuestionario: Nivel de madurez en dirección de proyectos.

1. ¿Las metas y los objetivos estratégicos de su organización se comunican y las entienden todos los equipos de proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

2. ¿Los proyectos de su organización tienen objetivos claros y medibles, además de tiempo costo y calidad?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

3. ¿Su organización cuenta con políticas que describen la estandarización, medición, control y mejoras continuas de los procesos de administración de proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

4. ¿Su organización utiliza datos internos del proyecto, datos internos de la organización y datos de la industria para desarrollar modelos de planeación y replaneación?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

5. ¿Su organización establece el rol del gerente de proyecto para todos los proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

6. ¿Su organización tiene los procesos, herramientas, directrices y otros medios formales necesarios para evaluar el desempeño, conocimiento y niveles de experiencia de los recursos del proyecto de tal manera que la asignación de los roles del proyecto sea adecuada?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

7. ¿Los gerentes de proyecto de su organización comunican y colaboran de manera efectiva y responsable con los gerentes de proyecto de otros proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

8. ¿Su organización tiene un enfoque estándar para la definición, recolección y análisis de métricas del proyecto para asegurar que la información sea consistente y precisa?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

9. ¿Su organización utiliza tanto estándares internos como externos para medir y mejorar el desempeño de los proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

10. ¿Su organización tiene hitos (*milestones*) definidos, donde se evalúan los entregables de proyecto para determinar si se debe continuar o terminar?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

11. ¿Su organización utiliza técnicas de gestión del riesgo para medir y evaluar el impacto del riesgo durante la ejecución de los proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

12. ¿Su organización tiene actualmente una estructura organizacional que apoya a la comunicación y colaboración efectiva entre proyectos dentro de un programa enfocado en mejorar los resultados de dichos proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

13. ¿Los gerentes de programas o multiproyectos evalúan la viabilidad de los planes del proyecto en términos de su cronograma, dependencias con otros proyectos y disponibilidad de recursos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

14. ¿Los gerentes de programas o multiproyectos entienden como sus programas y otros programas dentro de la organización forman parte de los objetivos y estrategias generales de la organización?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

15. ¿Su organización establece y utiliza estándares documentados, ejecuta y establece controles y evalúa e implementa mejoras para los procesos de administración de proyectos de sus programas o multiproyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

16. ¿Su organización considera de manera efectiva la carga de trabajo, requerimientos de ganancias o márgenes y tiempos de entrega límites para decidir la cantidad de trabajo que puede emprender?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

17. ¿Su organización define y prioriza los proyectos de acuerdo con su estrategia de negocio?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

18. ¿Su organización esta "proyectizada" en lo referente a las políticas y valores de la administración de proyectos, un lenguaje común de proyecto y el uso de los procesos de la administración de proyectos a través de todas las operaciones?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

19. ¿Su organización utiliza y mantiene un marco de referencia común de trabajo metodología y procesos de administración de proyectos para todos sus proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

20. ¿Los ejecutivos de su organización están involucrados directamente con la dirección administración de proyectos, y demuestran conocimiento y apoyo hacia dicha dirección?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

21. ¿Su organización establece estrategias para retener el conocimiento de recursos tanto internos como externos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

22. ¿Su organización balancea la mezcla de proyectos dentro de un portafolio para asegurar la salud de este?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

23. ¿Su organización recolecta medidas de aseguramiento de la calidad en sus proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

24. ¿Su organización cuenta con un repositorio central de métricas de proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

25. ¿Su organización utiliza métricas de sus proyectos para determinar la efectividad de los programas y portafolios?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

26. ¿Su organización evalúa y considera la inversión de recursos humanos y financieros cuando selecciona proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

27. ¿Su organización evalúa y considera el valor de los proyectos para la organización al momento de seleccionarlos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

28. ¿Su organización reconoce la necesidad de incorporar un Modelo de Madurez organizacional como parte de su programa de mejora en administración de proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

29. ¿Su organización incorpora lecciones aprendidas de proyectos, programas y portafolios anteriores a la metodología de administración de proyectos?

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

Ejercicio No. 2

Cuestionario: Nivel de metodología en dirección de proyectos.

1. ¿Cuántas diferentes metodologías de dirección de proyectos existen en su organización? (Por ej. considere si la metodología de dirección de proyectos de desarrollo de sistemas es diferente a la metodología de dirección de proyectos para el desarrollo de nuevos productos).

a. No tenemos ninguna metodología estandarizada.

b. Cada especialidad o área de negocio desarrolla y aplica su propia metodología.

c. Entre 2 y 3

d. 1

2. Durante la planeación de los proyectos, se sigue una metodología estandarizada que considera las 9 áreas de conocimiento de la dirección de proyectos:

a. No se sigue una metodología estandarizada, depende del gerente de proyecto en turno y de su equipo de trabajo.

b. Sólo están estandarizados los procesos de administración del alcance y del tiempo.

c. Lo indicado en (b), además de los procesos de costo y calidad.

d. Lo indicado en (c), además de los procesos de adquisiciones, comunicaciones, recursos humanos y riesgo.

e. Se integran de manera eficiente las nueve áreas del conocimiento de la dirección de proyectos.

3. La metodología de dirección de proyectos de mi organización establece métricas para el cálculo de indicadores principales de desempeño (KPIs) de acuerdo con los objetivos del proyecto para:

a. No se utiliza ningún indicador de desempeño o no se tiene una metodología estandarizada.

b. Alcance y tiempo.

c. Lo indicado en (b), además de costo y calidad.

d. Lo indicado en (c), además de adquisiciones, comunicaciones, recursos humanos y riesgo.

e. Se integran de manera eficiente KPIs de las 9 áreas del conocimiento de la dirección de proyectos.

4. La aprobación de un plan de proyecto en mi organización contempla:

a. Los planes se aprueban sin que se siga ninguna metodología o estandarizada.

b. Un presupuesto y un programa que no están integrados y sin una estructura de desglose de trabajos (WBS).

c. Acta del proyecto, WBS, estimados de costo, presupuesto y cronograma.

d. Lo indicado en (c) además del plan de calidad y el plan de adquisiciones.

e. Lo indicado en (d), además de análisis de riesgo, evaluación de participantes (*stakeholders*), asignación y balanceo de recursos, roles y responsabilidades y plan para administración de cambios de.

5. En mi organización la administración de cambios con respecto al plan autorizado del proyecto (línea base) se lleva a cabo de la siguiente manera.

a. No se administran los cambios.

b. Midiendo su impacto para facilitar la autorización de estos por los niveles facultados para hacerlo.

c. Lo indicado en (b) y se registra en una bitácora de cambios con los datos más relevantes.

d. Lo indicado en (c) de acuerdo con una metodología estandarizada de administración de cambios integrada con una metodología de administración de la configuración.

e. Lo indicado en (d), con un repositorio empresarial en una base de datos manejada por una herramienta corporativa de dirección de proyectos en línea que me permite documentar y difundir todos los cambios.

6. En mi organización las lecciones aprendidas y la mejora continua en dirección de proyectos se manejan:

a. No tenemos un proceso estandarizado para las lecciones aprendidas ni para la mejora continua.

b. Cada gerente de proyecto guarda los documentos principales de sus proyectos.

c. Existe un proceso de generación de lecciones aprendidas y se difunde al terminar cada proyecto.

d. Lo indicado en (c) además de que la PMO aplica las lecciones aprendidas para el proceso de mejora continua de procesos de dirección de proyectos.

e. Lo indicado en (d) además de contar con un repositorio de lecciones aprendidas y de procesos actualizados en una herramienta de *software* de dirección corporativa de proyectos en línea y de fácil acceso para todos los involucrados.

Ejercicio No. 3

Cuestionario: Herramientas de dirección de proyectos.

1. En mi organización, las herramientas de *software* disponibles para dirección de proyectos (con licencias disponibles para más del 80% de los proyectos) son:

a. No existen herramientas para dirección de proyectos.

b. Herramientas como hojas de cálculo (Excel), procesadores de texto (Word), láminas de presentación (PowerPoint), o similares.

c. Herramientas señaladas en (b), además de herramientas especiales para dirección de proyectos (MS Project o similar), en forma individual para los gerentes de proyecto.

d. Herramientas de dirección corporativa de proyectos (MS Enterprise Project Management, etc.), integradas, que manejan bases de datos corporativas con soluciones en línea y en tiempo real.

e. Herramientas indicadas en (d) que están integradas con otros sistemas corporativos (administración de documentos, ERP, CRM, etc.).

2. En mi organización, las herramientas de *software* que realmente se usan para la dirección de proyectos (con evidencia de uso en más del 80% de los proyectos) son:

a. No existen herramientas para dirección de proyectos.

b. Herramientas como hojas de cálculo (Excel), procesadores de texto (Word), láminas de presentación (PowerPoint), o similares.

c. Herramientas señaladas en (b), además de herramientas especiales para dirección de proyectos (MS Project o similar), en forma individual para los gerentes de proyecto.

d. Herramientas de Dirección Corporativa de Proyectos (MS Enterprise Project Management, etc.), integradas, que manejan bases de datos corporativas con soluciones en línea y en tiempo real.

e. Herramientas indicadas en (d) que están integradas con otros sistemas corporativos (Administración de Documentos, ERP, CRM, etc.).

3. Con respecto a la dirección de proyectos individuales, en mi organización existe un estándar de uso de herramientas de *software* de dirección de proyectos, con vistas y plantillas personalizadas para la empresa (más del 80% de los proyectos lo usan y lo presentan igual), para:

a. No se tiene un estándar cada gerente de proyecto lo usa a su discreción.

b. Manejo de cronogramas (diagrama de barras) y manejo de costos en forma independiente.

c. Manejo de alcance (WBS), tiempo (cronogramas, ruta crítica) y costos (estimados de costo internos y externos, presupuesto y línea base del costo) en forma integrada.

d. Lo indicado en (c), con la metodología del valor devengado o (Earned Value Management), con monitoreo de desviaciones, índices de desempeño, tendencias y pronósticos.

e. Lo indicado en (d), con análisis de escenarios, múltiples líneas base y con una metodología de gestión del riesgo (análisis cualitativo, análisis cuantitativo, simulaciones Monte Carlo, etc.).

4. Con respecto a la dirección de programas y multiproyectos, en mi organización existe un estándar de uso de herramientas de *software* de dirección de proyectos, con vistas y plantillas personalizadas para la empresa (más del 80% de los proyectos lo usan y lo presentan igual), para:

a. No se tiene un estándar cada gerente de proyecto lo usa a su discreción.

b. Manejo de cronogramas (diagrama de barras) y manejo de costos en forma independiente.

c. Manejo de alcance (WBS), tiempo (cronogramas, ruta crítica) y costos (estimados de costo internos y externos, presupuesto y línea base del costo) en forma integrada.

d. Lo indicado en (c), con la metodología del valor devengado o (Earned Value Management), con monitoreo de desviaciones, índices de desempeño, tendencias y pronósticos.

e. Lo indicado en (d), con análisis de escenarios, múltiples líneas base y con una metodología de gestión del riesgo (análisis cualitativo, análisis cuantitativo, simulaciones Monte Carlo, etc.).

5. Con respecto a la dirección del portafolio, en mi organización existe un estándar de uso de herramientas de *software* de dirección de proyectos, con vistas y plantillas personalizadas para la empresa (más del 80% de los proyectos lo usan y lo presentan igual), para:

a. No se tiene un estándar, cada director de portafolio lo usa a su discreción.

b. Los directores de portafolio y otros altos ejecutivos de la empresa sólo reciben: un informe resumen (en papel o electrónico) de los gerentes de programas y proyectos con la información del estado de los proyectos.

c. Los directores de portafolio y otros altos ejecutivos de la empresa tienen acceso a una página de Intranet o Internet en la que pueden consultar la información de los proyectos, pero sin poder llegar a mayores detalles.

d. Los directores de portafolio y otros altos ejecutivos de la empresa tienen acceso a una solución en línea (servidor de proyectos), en la que pueden consultar cualquier nivel que requieran de la información del portafolio, programas o proyectos.

e. Los directores de portafolio y otros altos ejecutivos de la empresa tienen acceso a una solución en línea (servidor de proyectos), en la que tienen un panel de control ejecutivo, con indicadores de desempeño tanto de objetivos de negocio como de objetivos de proyecto, en la que pueden consultar cualquier nivel que requieran de la información del portafolio, programas o proyectos.

6. Con respecto a la distribución y recopilación de información a todos los miembros del equipo, gerentes funcionales o de línea, y cualquier participante en los proyectos, en mi organización existe un estándar de uso de herramientas de *software* de dirección de proyectos, con vistas y plantillas personalizadas para la empresa (más del 80% de los proyectos lo usan y o presentan igual), para:

a. No se tiene estándar, cada participante lo usa a su discreción.

b. Los participantes reciben información de los respectivos gerentes de proyectos en formatos estandarizados (papel o electrónicos), que llenan con sus avances y lo regresan al gerente de proyecto.

c. Los participantes tienen acceso directo a las herramientas de *software* de dirección de proyectos e ingresan sus avances y estado de sus tareas en herramientas individuales por proyecto.

d. Lo indicado en (c), con un control de horas por persona y de cualquier otro tipo de recurso (interno o externo) que se requiera para el desarrollo de sus tareas, en herramientas individuales por proyecto.

e. Lo indicado en (d), en una herramienta en línea y en tiempo real (servidor de proyectos), con un sistema de autorizaciones por parte de sus líderes funcionales y de proyecto, ligado automáticamente al sistema de correo electrónico de la organización.

Ejercicio No. 4

Cuestionario: Nivel de desarrollo de competencia en dirección de proyectos.

1. En mi organización, el estado actual del proceso de desarrollo de competencia en dirección de proyectos es:

a. No existe un proceso para desarrollar competencia en dirección de proyectos.

b. Existe un proceso de selección y desarrollo natural los sobrevivientes se van desarrollando en las trincheras.

c. Existe un proceso de desarrollo de competencia en dirección de proyectos en algunas áreas de la empresa.

d. Existe un proceso de desarrollo de competencia en dirección de proyectos en el ámbito corporativo.

e. Existe un proceso de desarrollo de competencia en dirección de proyectos en el ámbito corporativo que está ligado al proceso de evaluación de desempeño.

2. En mi organización el estado actual del uso del proceso de desarrollo de competencia en dirección de proyectos es:

a. Ni se usa ni existe un proceso para desarrollar competencia en dirección de proyectos.

b. Existe un proceso de desarrollo de competencia en dirección de proyectos, pero solo lo usa el que esté interesado.

c. Existe un proceso de desarrollo de competencia en dirección de proyectos y se usa en algunas áreas de la empresa.

d. Existe un proceso de desarrollo de competencia en dirección de proyectos y existe evidencia de uso en el ámbito corporativo en más del 80% de directores de portafolio, gerentes de programas y de proyectos, miembros del equipo y demás involucrados.

e. Lo indicado en (d), además de que está ligado al proceso de evaluación de desempeño y al proceso de determinación de pagos, bonificaciones y promociones con base en el desarrollo personal y en los resultados obtenidos.

3. En mi organización, el proceso de desarrollo de competencia en dirección de proyectos de acuerdo con los niveles de puestos:

a. Ya había contestado que no existe un proceso de desarrollo de competencia en dirección de proyectos.

b. Está dirigido a los gerentes de proyecto.

c. Lo indicado en (b) y a los miembros del equipo.

d. Lo indicado en (c) y a los gerentes de programas y multiproyectos.

e. Lo indicado en (d) y a los directores de portafolio y altos ejecutivos de la organización.

4. Con respecto a la competencia de conocimiento de dirección de proyectos y específicamente en el conocimiento de la metodología en dirección de proyectos, mi organización se define de acuerdo con:

a. No se tiene un proceso estandarizado para el desarrollo de la competencia de conocimiento en dirección de proyectos.

b. Se autorizan cursos aislados para individuos que lo solicitan.

c. Existe una selección de cursos y talleres que ofrecen instituciones especializadas en capacitación de dirección de proyectos autorizados en el ámbito corporativo.

d. Se tiene un currículo de cursos y talleres personalizados de acuerdo con la metodología de dirección de proyectos de la organización y con ejercicios y casos reales que se ofrecen en el ámbito corporativo (por instructores internos o con colaboración de instituciones especializadas).

e. Lo indicado en (d), con un sistema de certificación individual basado en las mejores prácticas Internacionales.

5. Con respecto a la competencia de conocimiento de dirección de proyectos, y específicamente en el conocimiento del uso de las herramientas de *software* de dirección de proyectos, mi organización se define de acuerdo con:

a. No se tienen contemplados cursos en el uso de herramientas de *software* de dirección de proyectos, nuestro personal es autodidacta.

b. Se autorizan cursos aislados en uso de herramientas de *software* para individuos que lo solicitan.

c. Existe una selección de cursos y talleres que ofrecen instituciones especializadas en capacitación de dirección de proyectos autorizados en el ámbito corporativo.

d. Se tiene un currículo de cursos y talleres personalizados de acuerdo con la metodología de dirección de proyectos de la organización con ejercicios y casos reales que se ofrecen en el ámbito corporativo (por instructores internos o con colaboración de instituciones especializadas).

E. Lo indicado en (d), con un sistema de certificación individual basado en las mejores prácticas internacionales.

6. Con respecto a la Competencia de Desempeño de la dirección de proyectos, mi organización se define de acuerdo con:

a. No se tiene un proceso estandarizado para el desarrollo de la competencia de desempeño en dirección de proyectos.

b. Lo indicado en (a), pero al monitorear el desempeño de los proyectos se evalúa indirectamente el desempeño de los participantes.

c. Lo indicado en (b), pero se cuenta con un proceso de evaluación de desempeño de dirección de proyectos para los gerentes de proyecto.

d. Lo indicado en (c) pero para todos los participantes en los proyectos (gerentes de programas y multiproyectos, miembros de equipo, gerentes funcionales directores de portafolio y altos ejecutivos).

e. Lo indicado en (d) con un sistema auditorías de desempeño de procesos de dirección de proyectos, integrado al sistema de calidad de la corporación.

7. Con respecto a la competencia personal de dirección de proyectos, mi organización se define de acuerdo con:

a. No se tiene contemplado la competencia personal o el perfil de habilidades humanas (gerenciales), para la selección de candidatos a posiciones de dirección de proyectos.

b. Se contempla la competencia personal o el perfil de habilidades humanas (gerenciales), para la selección de candidatos a las diferentes posiciones relacionadas con la dirección de proyectos, pero no se tiene un proceso estandarizado para el desarrollo de la competencia personal.

c. Se contempla la competencia personal o el perfil de habilidades humanas (gerenciales), para la selección de candidatos a posiciones de gerentes de proyectos, y se tiene un proceso estandarizado para el desarrollo de la competencia personal.

d. Lo indicado en (c) pero también para gerentes de programas y multiproyectos y directores de portafolio.

e. Lo indicado en (d) pero para todos los participantes en los proyectos (gerentes de proyecto, gerentes de programas y multiproyectos, miembros del equipo, gerentes funcionales, directores de portafolio y altos ejecutivos).

Ejercicio No. 5

Cuestionario: Nivel de Metodología en dirección del portafolio.

1. La metodología de la administración del riesgo de proyectos en mi organización es:

a. Inexistente.

b. Más informal que formal.

c. Basada en una metodología estructurada soportada por políticas y procedimientos.

d. Basada en una metodología estructurada soportada por políticas, procedimientos, plantillas con lecciones aprendidas de proyectos anteriores y formas estandarizadas para ser llenadas.

e. Lo indicado en (d), además de servir de base para los criterios de toma de decisiones a nivel programas, multiproyectos y portafolio de proyectos de la organización.

2. La cultura de dirección de proyectos dentro de mi organización es mejor descrita como:

a. Nadie confía en las decisiones de nuestros gerentes de proyecto.

b. Intromisión ejecutiva, lo que ocasiona un exceso de documentación y microadministración.

c. Con políticas y procedimientos pero sólo en algunas áreas dirigidas por proyectos, y con nula o con deficiencias en áreas matriciales.

d. Basada formalmente en políticas y procedimientos, con roles y responsabilidades bien definidos a nivel miembros del equipo, gerentes de proyecto, gerentes funcionales, *sponsors*, gerentes de programas o multiproyectos, directores de portafolio y altos ejecutivos, en todas las áreas de la organización.

e. Lo indicado en (d), pero ya convertida en la forma habitual de trabajo de todos los involucrados, basada en la confianza, comunicación y cooperación.

3. En mi organización, el proceso de selección y priorización de proyectos dentro del portafolio corporativo es:

a. No existe un proceso de selección o priorización de proyectos dentro del portafolio corporativo.

b. La selección y priorización se realiza de acuerdo con el área que tenga más poder en la organización o grite más fuerte.

c. Existe un comité de decisiones que analiza las propuestas de proyectos para hacer una selección y priorización de estos, y determina que el portafolio resultante esté alineado con los objetivos estratégicos de la organización.

d. Lo indicado en (c), con un proceso estandarizado de selección y priorización de proyectos, basado en algún modelo de medición de beneficios, factibilidad financiera, *balance score card*, u otros.

e. Lo indicado en (d), con herramienta de dirección de proyectos en donde se publica claramente para los involucrados autorizados el proceso de selección y priorización, además de balancear los recursos estratégicos, de acuerdo con los requerimientos de cada proyecto, para generar planes realistas acordes con la capacidad de la organización.

4. Los criterios en los que se basa la priorización de proyectos en mi organización contemplan:

a. No hay criterios.

b. Clientes y grado de dificultad.

c. Lo indicado en (b), beneficios subjetivos y financieros.

d. Lo indicado en (c), beneficios financieros y riesgo.

e. Lo indicado en (d), alineación con obj. estratégicos, ventaja competitiva, sinergias y alianzas estratégicas.

5. En mi organización se hacen revisiones periódicamente en los puntos de control (Quality Gates) establecidos, para la aprobación de fases sucesivas de los proyectos, y cuando es necesario, se genera un documento de requerimiento de cambios para someterlo a evaluación y autorización por parte del comité de decisiones.

a. Definitivamente no.

b. En algunos casos, porque lo solicitan algunos clientes.

c. Lo indicado en (b) y en algunas áreas específicas de la organización.

d. Lo indicado en (c) y en los proyectos estratégicos.

e. En todo el portafolio corporativo.

6. Los indicadores de desempeño principales (KPIs) que se usan para el monitoreo del portafolio corporativo son:

a. No se tienen definidos indicadores de desempeño.

b. Se tienen algunos indicadores por proyecto, pero no es posible integrarlos en Programas o Portafolios.

c. Se cuenta con indicadores básicos de dirección de proyectos (tiempo, costo, alcance, calidad, etc.) estandarizados y de fácil integración a programas y portafolio.

d. Lo indicado en (c), además de indicadores de negocio (NPV, ROI, IRR, etc.).

e. Lo indicado en (d), incorporando el concepto de riesgo y la alineación con objetivos estratégicos corporativos.

Ejercicio No. 6

Cuestionario: Nivel de Metodología en dirección de programas y multiproyectos.

1. Mi organización establece y utiliza métricas para iniciar formalmente sus Programas o multiproyectos (proceso de inicio).

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

2. Mi organización identifica, evalúa e implementa mejoras para los procesos principales de dirección de programas y multiproyectos:

a. Definitivamente no se hace nada al respecto.

b. Para los procesos de Planeación.

c. Lo indicado en (b), además de los procesos de ejecución.

d. Lo indicado en (c), además de los procesos de control y cierre.

e. Lo indicado en (d), además de contar con un proceso de recopilación y difusión de lecciones aprendidas y un proceso de mejora continua.

3. Mi organización establece y utiliza métricas de desempeño para los procesos de las diferentes áreas del conocimiento de la dirección de programas y multiproyectos.

a. Definitivamente no.

b. Tiempo y costo.

c. Lo indicado en (b), además de alcance y calidad.

d. Lo indicado en (c), además de adquisiciones, recursos humanos comunicaciones y riesgo.

e. Se integran en forma eficiente las nueve áreas del conocimiento.

4. Mi organización considera de manera efectiva la carga de trabajo de los recursos involucrados en los proyectos, requerimientos de ganancias o márgenes, y tiempos de entrega límites para decidir la cantidad de trabajo que se puede emprender.

a. Definitivamente no.

b. No creo.

c. Parcialmente.

d. Se hace el esfuerzo.

e. Definitivamente sí.

5. Mi organización planea la utilización de recursos de la siguiente manera:

a. No se planea con base en límites o restricciones de recursos reales, los recursos se asignan y se buscan conforme se autorizan los proyectos.

b. Se revisan las disponibilidades de los recursos estratégicos y las prioridades conforme se detalla el cronograma para su autorización.

c. Se planean los proyectos estableciendo perfiles con las habilidades necesarias en la asignación de actividades para posteriormente planear las asignaciones basadas en la disponibilidad real de recursos.

d. Lo indicado en (c), pero únicamente se revisan capacidades de trabajo para posteriormente balancear sobreasignaciones en un horizonte de no más de 6 meses.

e. Lo indicado en (d), con la facilidad de un sistema centralizado de dirección de proyectos que facilita la solución de sobrecargas de trabajo al manejar una base de datos integral en un servidor.

Ejercicio No. 7

Cuestionario: Nivel de Oficina de Dirección de Proyectos (PMO).

1. En mi organización, el estado actual de la Oficina de Dirección de Proyectos (PMO) es:

a. No existe una Oficina de Dirección de Proyectos en mi organización.

b. Alguien (grupo o individuo) dentro de la organización ha tomado el rol de la PMO, sin estar reconocido oficialmente.

c. Existen algunas PMOs en algunos departamentos pero sin trabajar en forma integrada.

d. Lo indicado en (c), además de existir una PMO en el ámbito corporativo con funciones, roles y responsabilidades claramente definidos.

e. Lo indicado en (d), existiendo una integración total, con una metodología estandarizada y un proceso de mejora continua establecido.

2. En mi organización el nivel de responsabilidad de la Oficina de Dirección de Proyectos (PMO) se limita a:

a. No existe una PMO oficialmente establecida en mi organización.

b. Dar soporte a proyectos para la correcta utilización de técnicas y herramientas en dirección de proyectos, establece métodos, procesos y estándares.

c. Lo indicado en (b), además recopila información de todos los proyectos para consolidación y análisis de las desviaciones y pronósticos emitiendo informes consolidados a toda la organización. Se encarga también de la capacitación en dirección de proyectos y actúa como consultor o mentor interno.

d. Lo indicado en (c), además de hacer auditorías y recomendaciones a los proyectos, asigna y balancea los recursos del portafolio de acuerdo con las prioridades establecidas, establece el plan

de desarrollo de competencia de los gerentes de proyecto y puede participar en el comité de decisiones.

e. Lo indicado en (d), además de tener completa responsabilidad de la dirección del portafolio, estableciendo prioridades de este de acuerdo con el plan estratégico de la empresa.

3. En mi organización la ayuda que proporciona la Oficina de Dirección de Proyectos (PMO) a los ejecutivos se limita a:

a. No existe una Oficina de Dirección de Proyectos oficialmente establecida.

b. Existe una PMO, pero no se percibe una gran ayuda, más bien es reconocida como un generador de burocracia y un gasto innecesario.

c. Se reconoce su ayuda para la identificación, planeación y control de proyectos con orden.

d. Lo indicado en (c) pero además como un gran contribuidor para alcanzar el éxito de los objetivos de los proyectos.

e. Lo indicado en (d), pero además es parte fundamental en el logro de los objetivos estratégicos de la organización.

4. Los roles definidos en la Oficina de Dirección de Proyectos de mi organización son los siguientes:

a. No existe una Oficina de Dirección de Proyectos establecida oficialmente.

b. Existe una PMO, pero no se tienen claramente definidos los roles y responsabilidades de los integrantes.

c. Están definidos los roles de ejecutivo de la PMO, especialista en la metodología y administrador de datos y se actúa conforme a estos.

d. Lo indicado en (c), además de estar definidos los roles de instructor o mentor de dirección de proyectos mentor de herramientas de dirección de proyectos y especialistas para *help desk* y se actúa conforme a esto.

e. Lo indicado en (d), además de estar definidos los roles de director del portafolio de proyectos y administrador de recursos estratégicos y se actúa conforme a ellos.

5. En mi organización las comunicaciones corporativas en lo relacionado con flujo de información de dirección de proyectos se definen como:

a. Informales.

b. Se establecen comunicaciones directamente entre los involucrados, mediante cartas, faxes y correos electrónicos según el gusto de los involucrados.

c. Existe un sistema establecido por la PMO pero con algunos problemas de eficiencia y confiabilidad.

d. Existe un sistema establecido por la PMO que funciona bastante bien con ayuda de herramientas de *software* personalizadas.

e. Existe un sistema establecido por la PMO, que funciona bastante bien con ayuda de herramientas de *software* basadas en un servidor central, manteniendo una comunicación en línea y en tiempo real con todos los involucrados.