

Project Management Office:

The process of creating a PMO concept

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Abstract

Today, shipbuilding is undergoing fundamental changes as customers are expecting to receive products faster, better quality and in the most economical way. This means that shipyards must concentrate on producing products faster and at the lowest possible cost.

Development projects have become highly important part of the case company daily routine. In addition to daily business, many projects have struggled to successfully implement on schedule, in scope and at eligible costs.

The case company decided to establish Project Management Office to be the central function and to help with project management challenges that people are facing. The role of the PMO is to implement the company strategy and monitor project performance and execution progress. The PMO creates and maintains the PPM tools and templates and provides facilitation and training support for PMO stakeholders.

This thesis is action research and will develop a new PMO concept model, which creates the governance structure for case company. It will increase information sharing cross-functionally and bring business case and risk management thinking to project level. The PMO's objectives will be tied closely to case company strategy and goals.

The PMO implementation work conducted between April 2017 and March 2019 when full PMO concept was finalized with positive results.

Language: English

Keywords: Strategy, Project Portfolio, PMO

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Abbreviations

BU	Business Unit
CPI	Cost Performance Index
EAC	Estimate at Completion
ERP	Enterprise Resource Planning
EVMS	Earned Value Management System
IT	Information Technology
KPI	Key Performance Indicator
NPS	Net Promoter Score
PDM	Product Data Management
PMI	Project Management Institute
PM METHOD	Project Management Methodology
PMO	Project, Program or Portfolio Management Office
PM	Project Management, Project Manager
PPM	Project Portfolio Management
PSO	Project Support Office
R&D	Research and Development
ROI	Return on Investment
SME	Subject Matter Expert
SPI	Schedule Performance Index
SPO	Strategic Program Office
STEERCO	Steering Committee

1 Introduction

Today, shipbuilding is facing fundamental changes when customers are expecting to get products faster and with high quality and in the most economical way. Nowadays it means that shipyards must focus on getting products ready more rapidly and at lowest possible cost. The case company has understood that increasing need for service design could be one of the answers to compete against low cost countries which have started to manufacture products.

The existing demand to compete globally, gain market share, cut costs and increase profits, helps to produce better products and services faster. These are just some of the reasons why companies are looking for best practices to improve time-to-market, cost-to-market and quality-to-market. Within businesses, the lines between operations business management and project management have become, and will remain, blurred and interlaced (Bolles & Hubbard, 2016.)

This thesis is action research orientated and searching for the answer to how Project Management Office (PMO) concept should be designed and finally implemented avoiding major obstacles and pitfalls, focusing firstly on the right things without crunching the whole PMO entity in parallel. The content of this research was conducted in two years and focuses on the strategy, Project Portfolio Management through PMO concept creation.

The case company PMO is a virtual service organization that supports development projects and ensures that the energy and resources are focused on the projects that matter the most. The global PMO is the highest level of PMO's within the virtual organization. It will provide project portfolio management support, methodological support, performance tracking and evaluation support and also direct project, program and portfolio support for development initiatives.

Based on discussions with several people from different organizations, there is a strong requirement for Project Management Office (PMO) set up at case company. As of today, the important aspect is to continue building high quality products. At the same time implement new investments which will help case company to manufacture high quality products economically in the future. New investments require several process changes and new ways of working hence that is the major reason PMO will be implemented to support this change.

1.1 Background

Prior to this thesis, the case company has had no centralized and controlled way to manage a multi-project environment. Based on personal interviews, people feel that there is no strategic alignment between development projects and company strategy. The linkage and communication are missing between the projects and business organization. People are often asking what is happening next and that is causing different rumors. Due to a long and demanding history, process improvement culture is nearly nonexistent and there is lack of systematic communication between the departments.

The degree of using internal resources for project work is increasing at all departments. It is in fact a major problem when personnel are expected to support not only product creation but also development projects in parallel. The need for project management training is heavily relating to that. People have no experience of development project management processes and organizations' governance models are not supporting this yet either.

First impression is that requirement is partly not even recognized in the changed management process? Even though some aspects are known, the challenge is to set the targets at a reasonable and realistic level and continue to monitor the progress based on agreed principles.

Development projects have become a more important part of the daily routine at the case company. Carried out next to everyday business, project teams often find it difficult to follow up on the tasks, development project evaluation criteria and outcomes next to the regular daily work. As a consequence, several projects have struggled to be successfully implemented in the timeline, scope and approved costs.

Currently, there is no full transparency on global and local projects in a way that is needed. Departments are using different project management tools and Project Management methodology and a project portfolio management tool is missing from the scene totally.

The case company has agreed to establish PMO in April 2017. The purpose of the PMO is to provide guidelines, structure and standardized project management process on a global as and local project levels. Additionally, the project portfolio management assures a project portfolio execution in the sense of the corporate strategy and a balanced portfolio. Therefore, the project portfolio management aims to support top management with transparency and reporting for decision making.

After the PMO concept structures and processes have been defined and operationalized on a global level, it is the time to set the conceptual element of a local PMO at site level with the implications for a global portfolio management. The target is that undertaking a project on any of the case company sites shall be the same experience for all stakeholders.

1.2 Objectives and limitations

The purpose of this thesis is to create a PMO concept model for the case company and to understand other companies from other industries. The thesis is action research and will look into the literature and finally find the way how to create the most optimal Project Management Office to support company decision making, project reporting and prioritization of development projects. Various different service design methods will be used during the action research.

Objectives

The main objective of this thesis is to create the PMO concept model developed for the case company, as well as the project portfolio management methods and tools that will be utilized in the company's development project portfolio management process.

The PMO will be helping to support the case company staff to increase visibility for development project management. Currently case company is lacking transparency for projects and new investments, however this thesis will design the concept how to manage whole process at the same time.

The PMO concept model rationalizes a multi project environment to manage the whole development project portfolio during the change management process. The concept of a stand-alone organization within a company committed to project, program and portfolio management has gained fashion and momentum in recent years. Generally, these units are commonly referred to as “PMOs” (Kaufman & Korrapati, 2007.)

The PMO concept will establish controlled and centralized coordination for the case company development projects. It will represent a new governance model for decision making. It will increase information sharing cross-functionally and bring business case and risk management thinking to each project. The PMO's objectives will be tied closely to company strategy and goals.

Limitations

The purpose of this thesis is neither to measure the conceptualization performance nor business value of the PMO, however, to keep the focus on the ideation, concept work and implementation of the new PMO concept and create the selected tools to support Project Portfolio process implementation.

1.3 Research Problem

This chapter will provide insight into the research problem and starting point prior to the PMO introduction. Internal survey proves (Figure 1 and Figure 2) that Project objectives, scope, and target delivery date have not always been clearly and concretely defined.

Below the Figure 1 illustrates the main issues reported by respondents:

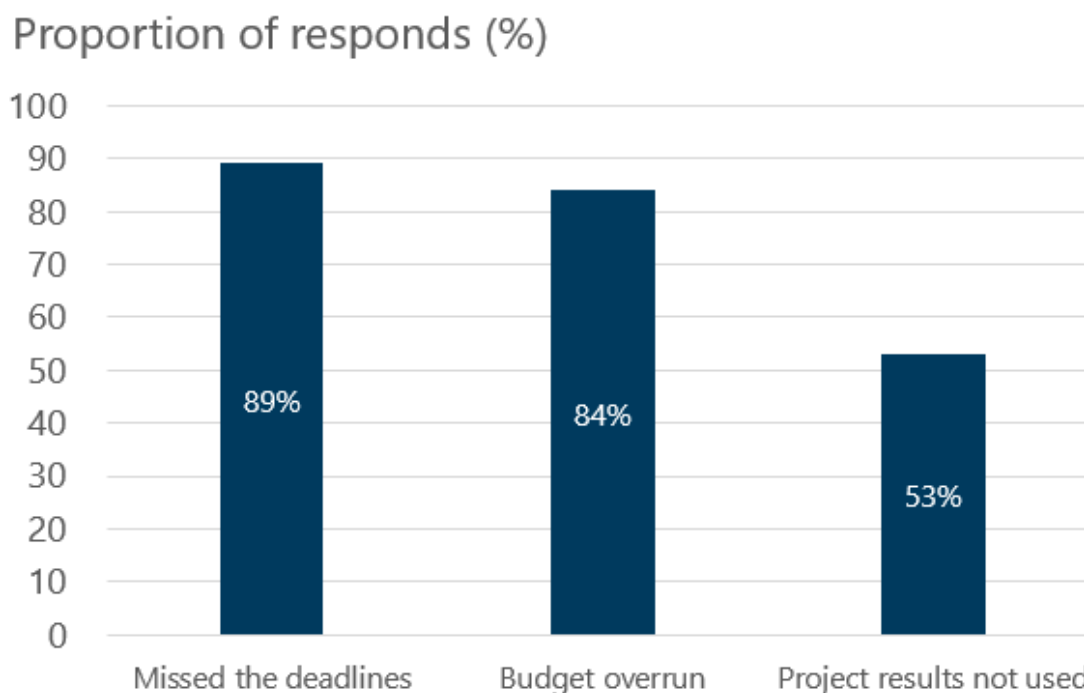


Figure 1. Project failure types (Case Company Survey 2016)

At all levels, there is insufficient appreciation to work on the improvement projects systematically. Projects often lack adequate and committed resources, limited progress

tracking and project governance is not supporting efficient steering. On top of the issues, project management methodology is not fully utilized across the project landscape.

The following Figure 2 describes failure root causes reported by respondents:

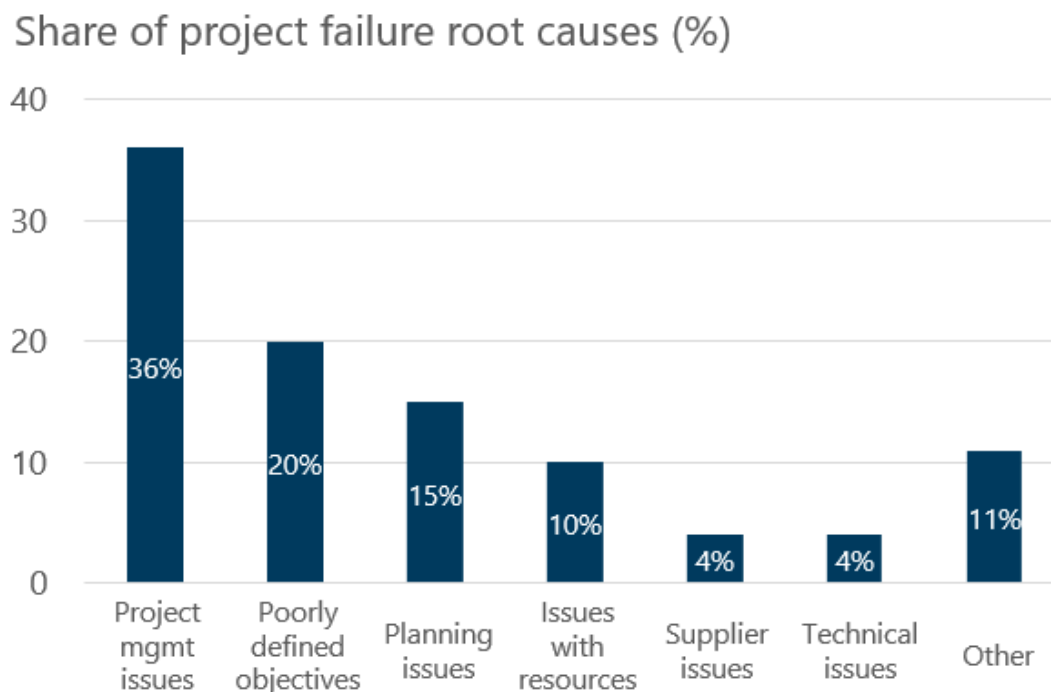


Figure 2. Project failure root causes (Case Company Survey 2016)

Research Questions

1. How does the PMO concept support the process?
2. What are the key components that create the PMO concept?
3. How does the PMO concept works?

1.4 Case Company

The case company is a family-owned company and is one of the leading European shipbuilding companies. Turku site was founded in 1737. The company provides state-of-the-art technology solutions, advanced construction processes and cutting-edge innovations for cruise operators and other ship owners. The company specializes in building cruise ships,

car-passenger ferries and special vessels. Over the years the site has built more than 1,300 new products for customers around the world.

The case company has three subsidiaries, providing a Cabin Factory services, turnkey solutions to public spaces in ships and engineering offering services for shipbuilding and offshore.

Today, the case company has around 2,000 employees and is a major employer in Southwest Finland but also throughout the maritime network in Finland. It is remarkable that, all combined, the Finnish maritime cluster employs over 40000 people. The cluster is a network of all actors involved in technology, education, training and manufacturing, formed around the maritime industries and shipping.

The company has a track record of extremely high customer satisfaction and have succeeded in surpassing our customers' expectations. It has proven its reliability by timely deliveries and the fulfilment of all high-quality requirements in high end products.

The case company is constantly developing innovative conceptual solutions in close cooperation with their customers. Offering leading-edge expertise in turning customers' visions into reliable and profitable products (Case Company 2019.)

The case company management structure is presented in Figure 3:

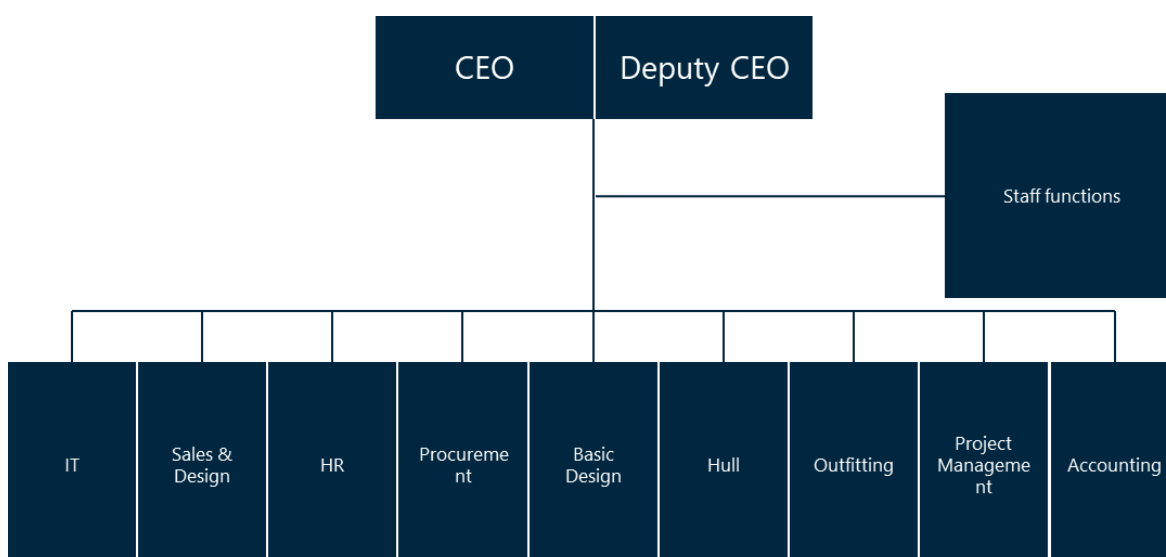


Figure 3. Case company management structure

Before PMO

Prior to PMO the company did not have a centrally coordinated office that would collect new initiatives, follow-up progress and evaluate new candidates, develop project management capabilities etc.

In 2014 the company made the decision to introduce project management methodology and evaluate different options on the market. In 2015 Hermes 5 was selected to be the company project management methodology and it was named Hi5. The actual PM method roll out started in 2016 in continuous improvement format. However, the roll out was evidently poor on a global level and did not offer proper PM trainings after start. There was not any dedicated local support to help with operative issues.

In April 2017 the case company decided to establish PMO to be the central function to help with challenges that people were facing (Figure 2). Those challenges were identified when PMO started its journey.

The Figure 4 illustrates the development journey prior to PMO introduction:

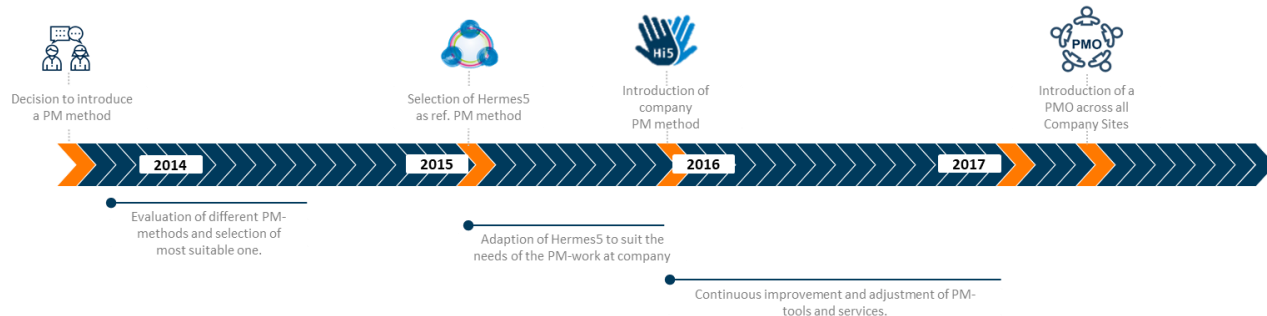


Figure 4. Development history prior to PMO introduction

1.5 Thesis Structure

Chapter 1. Introduction. This chapter will provide the background, objectives, limitations and information about the case company. The chapter presents the structure and objectives of the research, the research problems and the scope of the research. In addition, the introductory chapter provides detailed information and background of the case company.

Chapter 2. Literature review. This chapter outlines the basic principles of the strategy. Then looking at the basic principles of portfolio management, linking strategy to the portfolio, the project portfolios as part of the management system, today's project portfolio problems and

the right combination of the right projects. Finally, providing theoretical background of PMO and its structures.

Chapter 3. Research Methodology. This chapter focuses on research strategy, firstly exploring the basic principles of action research. Finally, presenting description for service design methods used in this research and the related theoretical background.

Chapter 4. PMO implementation process. This chapter contains the concrete results of the work. The results consist of the PMO concept model developed for the case company, as well as the project portfolio management methods and tools that will be utilized in the company's development project portfolio management process. The PMO concept work will be divided into phases required by case company project management method.

Chapter 5. Discussions. The chapter discusses the factors involved in designing and implementing the PMO structure and portfolio management process, the steps in the implementation process, and the recommended steps to be taken to successfully implement the portfolio management process into the daily operations of the organization.

Chapter 6. Conclusion. The chapter evaluates the results of the work from the perspective of the case company, summarizing the achievements after PMO has been introduced. Finally, proposing thoughts for future development.

2 Literature review

This chapter will provide insight into the literature and especially to the strategy, project portfolio management and project management office. The chapter outlines the basic principles of the Strategy. Then looking at the basic principles of portfolio management, linking strategy to the portfolio, the project portfolios as part of the management system, today's project portfolio problems and the right combination of the right projects. Finally, deep diving to theoretical side of PMO, PMO definition, types and roles of PMO, PMO maturity model and what are the requirements of introducing a PMO.

2.1 Strategy

The business world is moving faster than ever. Innovation-driven strategic change means that project management teams are under pressure to be more agile when implementing projects. One consequence of this is that teams do not take the time to breathe and reach the

main milestones, reach goals along the way, or even successfully execute the projects. This is a huge mistake, says Cotgreave (2017.)

Artto et al. (2011, 287) has defined that the strategy involves selecting business objectives and the means to achieve them. Strategic management is again about managing a company to succeed in the future operating environment with existing and possibly new resources.

Based on Artto et al. strategy can be seen in two reinforcing but slightly different ways. The overall strategy of the company forms a common basis for its sub-strategies - for example, business and development sub-strategies, which are used in separate units. A business strategy is best reflected in the choices of business content and implementation. The business strategy guides delivery projects (and other ways of doing business), and its implementation may require various development and change projects. Typically, decisions are made early in the project lifecycle to ensure that projects implement the chosen business strategy. The development strategy involves choosing the means to influence future business indirectly and to build preparedness for future business strategies (Artto et al. 2011, 287.)

For some people, strategy is a clear plan, direction, and roadmap, while for others it is an unpredictable development path that takes shape in practice - for example, in a project. There can be a talk about the planned strategy (or strategic plan) and the emerging strategy that will be created during the project. The sum of the executed parts of the planned strategy and the resulting strategy results in the executed strategy. The strategy lives and changes, even though long-term decisions are made from time to time and guide the focus of the company. Continuous strategy renewal is typical in the project business because projects are temporary and renewable. When choosing and executing projects, a new emerging strategy can often be detected, and thus the actual strategy of the company can be traced to the projects. Projects also provide the impulse to renew the strategic plan of the company and can change the course of the company (Artto et al. 2011, 287-288.)

Operational-level strategic priorities are consistent with and support company-level strategies. Priority alignment is intended to contribute to better organizational performance as well as project success, just as misalignment is expected to impair performance and project success (Alsudiri et al. 2013). The recommended strategies are lower cost, cost leadership, differentiation and focus (Ormanidhi & Stringa 2008).

2.2 Project Portfolio Management

A project portfolio refers to a group of simultaneous projects and project opportunities that share common strategic objectives and compete for the same resources (Artto et al 2011, 304). The Project Management Institute (PMI) states that Portfolio management aims to assure that the organizations can benefit from project selection and successful execution. It comprises the centralized management of one or several project portfolios in order to achieve the strategic goals. The PMI research has proofed that portfolio management helps to reduce the gap between strategy and execution (PMI 2019.)

Agyapong defines that project portfolio management allows companies to choose the right projects and monitor the efficiency of related to resources. It is an important tool that supports decision-making and provides the information and metrics needed to track strategy implementation across different levels of the organization (Agyapong 2016.)

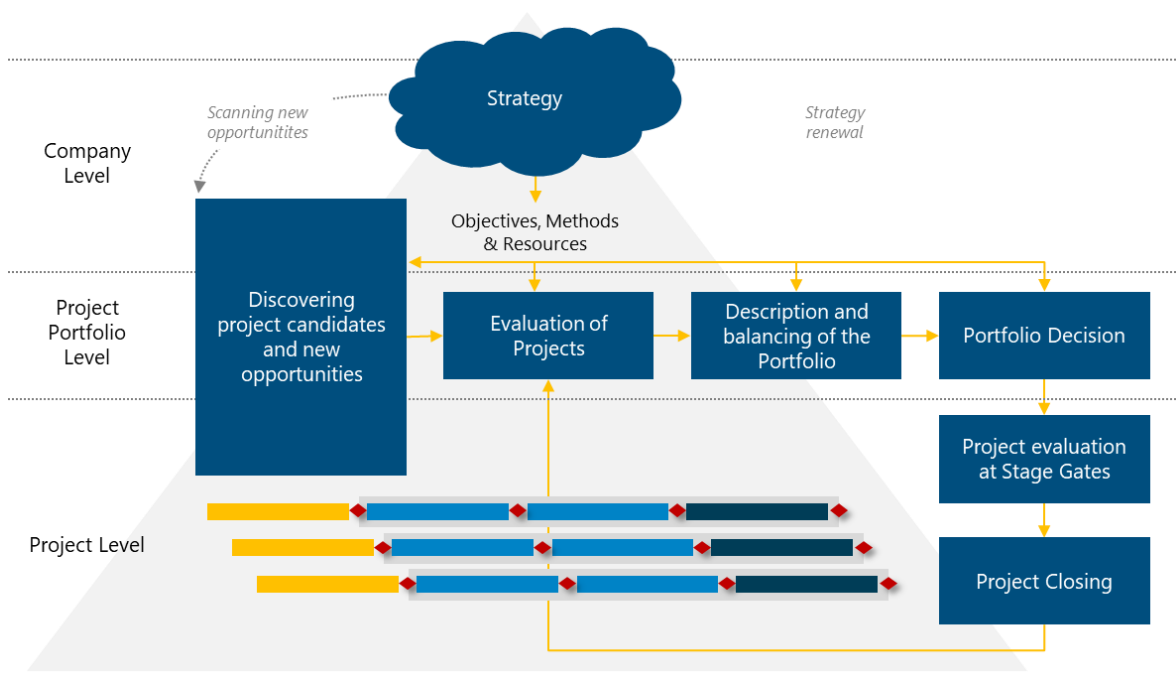


Figure 5. Project Portfolio Management Process (Artto et. al. 2011, 305)

Solomon is saying that Project Portfolio Management organizes a series of projects into a single portfolio that consists of reports describing project goals, costs, schedules, achievements, resources, risks, and other critical factors. Top management can then regularly review entire portfolios, allocate resources and tailor projects to produce the highest benefit (Solomon 2002.) Cottino emphasizes that the Portfolio management helps to ensure that the

properly selected projects generate the greatest benefit for business that is balanced with constraints, such as resources and costs (Cottino 2015). Sopko is stating that the portfolio management ensures that an organizational project portfolio management initiatives and deliverables are aligned with the organizational strategic plans (Sopko 2015).

In order to be successful in portfolio management, it is important to monitor the best projects and programs and thus give them the opportunity to increase the value quickly and at low cost (Agyapong et al. 2016).

Linking Strategy Project Portfolio

Over the past decade, the organizations around the globe have linked portfolios, programs, and projects together with their business strategy to get their strategy implemented. However, most companies have only defined a link to criteria for choosing the correct projects, without forgetting the strategic link during the project lifecycle (selection, prioritization, resource balance, start-up, planning, implementation, management, and closure) (Anyosa Soca 2010.)

The company portfolio is the main tool for assessing the implementation of the strategy and ensuring that the selected projects are implemented with key resources. It acts as an organizations "health check", aiming to achieve the strategy (Agyapong et al. 2016). Sedlmayer is stating that the organizational strategy is a plan that integrates the necessary stakeholders, a framework that provides guidance and ensures that initiatives are consistent with overall objectives. Without successful implementation as its main purpose, the strategy will remain a dream and never become a reality. To execute the strategy in the most efficient way, project portfolio management and the business organization projects and programs must provide robust processes, models, tools, and expertise (Sedlmayer 2019.)

Sedlmayer adds that the strategic importance of project management in the business world is growing rapidly. He thinks that one reason for acceleration may be the strong belief of business leaders in aligning project management with their business strategy, which can significantly improve the achievement of organizational goals, strategies and performance (Sedlmayer 2019.)

Most companies with a clearly defined strategy, try to integrate their strategy into their project business. Most companies do this only once during a project budget approval or at the planning delivery stage. However, it is imperative that integration is ensured throughout

the lifecycle of the project, which means launching, planning, implementing, monitoring, controlling and closing the project. Each strategic change shall be communicated to the project and all changes to the project scope shall be analyzed for its impact to strategy (business outcomes). (Anyosa Soca 2010.)

Agyapong et al. (2016) defines that there are four major success factors to ensuring the strategy is implemented seamlessly through strategic portfolio management:

1. Executive buy-in and support
2. Working governance with clear roles and responsibilities
3. Active stakeholder engagement
4. Tracking of overall portfolio health and progress (Agyapong et al. 2016.)

Generally, people say that the integration of project management with strategy takes place at project, program and portfolio levels. It happens often that, projects that are carried out only to satisfy the urgency or interests of some senior managers and which have not been strictly implemented to achieve the results of the business. If you analyze where the most of your organization's budget is invested, it will be noticed that a large proportion of it is not invested in strategic business projects, but rather on the company's subsistence of the business or in unnecessary initiatives (Anyosa Soca 2010.)

Project portfolios as part of the management system

A project portfolio management (PPM) system is an integral part of an enlightened organization. The PPM includes the logical and formal selection of projects and the methodical implementation of these projects for logical and successful completion. The purpose of PPM is to select and prioritize projects that achieve the highest value in accordance with pre-established portfolio management business decisions and priority criteria. The primary advantage of PPM system is that only the right projects are selected and/or continued. Projects in preparation are fully aligned with the company's strategic business objectives (Rad et al. 2008.)

With portfolio management, an organization ensures that projects are consistent with business strategies, hence it is clear why a particular work is being done. In order to remain objective, it is important to develop standards for transferring projects into and out of the

portfolio. The key to managing projects and programs is that the plans are accurate and clearly communicated to enable efficient portfolio decision-making. Emerson says that at the top level, projects are part of the programs and portfolios, and the programs are part of the portfolios. The author adds that all are different, but they are most effective when they will be managed as one (Emerson 2018.)

Andrews defines that the development and maintenance of an integrated project management system to support all project functions in business units is required to monitor, manage and report on project work at the company level. The author says that the PMO organizations must provide a full company-wide scheduling and resource planning feature that supports all business units. Andrews adds that Company-wide project management systems should include basic elements such as scope, schedule, costs and risks. Implementation elements such as forecasts, changes and financing. Reporting elements such as baseline, performance, forecasts, actual costs, labor costs, variance analysis, change requests and fund costs. Finally, Andrews emphasizes that common tools include applications for scheduling, risk management, EVMS processing, EVMS data reporting, checklists, templates, and forms (Andrews 2014.)

Sopko is stating that in today's global economy, valuable resources are scarce. Improper allocation of critical resources can mean either wealth or business closure. Continuing the use of resources for delayed projects will prevent the organization's portfolio from starting or completing other projects as planned. The organizational outcome is that it completes less projects per year, delays critical capabilities, and performs less in a profitable manner (Sopko 2015.)

Emerson say that project, program and portfolio management are not the same elements. The author adds that the bottom line is that they work together. For a portfolio manager to be effective, he needs to understand project management. It allows the Portfolio manager to submit the right questions to the project manager by interpreting the data in a more effectively for a well-considered portfolio strategy (Emerson 2018.) When projects are properly selected and prioritized, the remaining tasks of a well-managed project portfolio management system include managing project portfolios with a unified funding structure, carefully managing multiple projects from a single pool of resources, and properly managing the success of individual projects (Rad et al. 2008).

Today's project portfolio problems

More often companies suffer from misaligned projects and the lack of a systematic approach to adapt project management to business strategy. Although projects are an essential part of the organizational strategy of many companies, project management is often not recognized as an operational strategy and is rarely seen as a business process, which makes it difficult to achieve project management and business strategy alignment (Sedlmayer 2019.)

Although the concept of a PMO is relatively new, all related activities have taken place in any company undergoing any kind of change. These functions may have been more or less formalized in one or more locations, from the various committees on the back of the envelopes to the torn sheet of note paper on the CEO's desk. However, the establishment of the PMO transfers some or all of this control to the bureaucratic unit and inevitably creates an idea of the loss of power. Even if intellectually chartering PMO, leaders understand the needs and benefits, loss of gut level control can lead to cultural resistance, “under the radar” projects, and an eroding lack of effectiveness. This cultural reaction must be addressed by exchanging the value and success of the perceived loss or the PMO is at risk (Kaufman & Korrapati 2007.)

Based on Singh et al. research three major challenges in portfolio were (1) a rigid corporate culture and inability to manage organizational change, (2) poorly trained project managers and PMO staff, and (3) a poor defined change management strategy. The author adds that to address these challenges, organizations must have a strong PMO master, start small and demonstrate the value of the PMO, gain the support of opinion leaders, hire an experienced program manager understanding the organization, bring the most skilled PM's to the PMO implementation team, adopt a flexible change management strategy and standardize PMO processes. Leaders should carefully consider the trade-offs between “light” and “heavy” PMO structures, recognizing that while “light” PMO organizations may not have the same impact on the organization, they are more likely to succeed. Leaders should consider obtaining basic knowledge of project performance so that they can adopt objective measures to assess the impact of the PMO (Singh et al. 2009.)

Portfolio Management Methodology

As stated earlier in this thesis, Emerson and PMI say that the portfolio management is the centralized management of one or more portfolios to achieve an organization's strategic goals. In organizations, often have limited resources, whether it is in cost, people, space or

equipment. Several projects and programs can be made based on the organization's strategy; company must decide which projects are correct ones and in what order they should be implemented. Emerson is emphasizing that it is critical to look not only at individual level programs and projects, but also to see how these meet the overall goals of the organization (Emerson 2018.)

Emerson say that at the same time, it is important evaluate the balance level of the portfolio. The author adds that the organization must be awake when developing new opportunities. The risks need to be taken, but the portfolio should not be so risky that all can disappear over time (Emerson 2018.)

Emerson is stating that in addition to prioritization and selection of projects and programs in portfolio management is including a balancing element in which the right projects and programs are being selected and executed. The author adds that monitoring and control will have an essential role in the process because the portfolio's composition is not a single decision. Emerson emphasizes that assessments should be carried out for a regular cadence. It may be decided that the priority of the project will decrease, and others will change. The project can be temporarily or permanently removed from the portfolio (Emerson 2018.)

The right combination of the right projects

Cottino say that portfolio analysis includes initiatives from both the demand management process and ongoing projects. The author adds that the analysis is a comprehensive overview of all projects, regardless of the situation and actions, such as starting, continuing, terminating or postponing. Because the portfolio is alive, some new initiatives with a higher strategic leverage or priority may require the termination or postponement of other projects (Cottino 2015.)

Around these elements, the PPM tool provides the greatest added value and aims to help portfolio managers in the project selection process, as well as their project prioritization, cost-benefit analyses and risk management activities (Cottino 2015.)

Cottino is stating that the first action in the Portfolio definition is a list of portfolio components. The demand management consists of defining models and feeding the properties of the portfolio components to categorize these elements and create a business case (Cottino 2015.)

Agyapong et al. defines that it is very important to keep the portfolio balanced so that the company has the right time to make decisions, on projects that either continue or will be terminated. Implication of such decisions within an organization is critical and must be treated carefully (Agyapong et al. 2016.)

Oltmann says that the effective condition of portfolio management is a systematic way to differentiate between candidate projects which will be selected. The definition for selection is unique to every company. For example, one company may place the highest priority on environmental protection, while another company prioritizes ROI. Limit the number of criteria strictly from four to ten, so that the amount of information remains manageable. Oltmann emphasizes that the right criteria are critical because the bad criteria will naturally allow companies to choose the bad performing projects. When defining the criteria, there are funding and scoring two priority approaches (Oltmann 2008.)

Table 1 includes examples of both types of selection criteria:

Financial
<ul style="list-style-type: none"> • Payback period
<ul style="list-style-type: none"> • Net present value (NPV)
<ul style="list-style-type: none"> • Bang for Buck (BBI)
Scoring
<ul style="list-style-type: none"> • Market attractiveness
<ul style="list-style-type: none"> • Alignment to strategy
<ul style="list-style-type: none"> • Product and competitive advantage
<ul style="list-style-type: none"> • Technical feasibility
<ul style="list-style-type: none"> • Leverage of core competencies

Table 1. Portfolio assessment criteria types (Oltmann 2008)

Agyapong et al. say that lately, several organizations have struggled with achieving their business strategy, due to various factors, the most prominent of which is the proper use of investments and allocation of resources. Portfolio management is the most important tool that company can use to ensure that the strategy is properly implemented. (Agyapong et al. 2016)

Portfolios that best achieve their goals have a higher share of uncertain projects. Their leaders divide most of the core team members into more insecure projects, are more likely to leave some loose capacity when loading their portfolios and drain the portfolio pipeline faster. Leaders whose portfolios have a higher percentage of successful projects in the market review their portfolios more often, are less tolerant of scheduling delays, and increase resources on projects instead of letting them delay (McDonough et al 2003.)

The priorities for project portfolio selection and implementation are those that deliver the greatest profit at the lowest possible cost and with minimal risk, as well as those that facilitate the solution of specific social and economic tasks (Chernenko & Yakovlev 2016).

2.3 Project Management Office (PMO)

Many organizations today have recognized the need for a project management office (PMO) to achieve project management oversight, control, and support (Hill 2004). The PMO is an administrative mechanism that provides a point of contact for the organization's project management activities. More often, organizations are choosing to set up a Project Management Office (PMO) to support, manage and streamline their project management efforts. PMO is referred to by various titles such as Project Office, Project Management Office, Project Management Center of Excellence or Project Management Department (Rad 2001.) The PMO strives to achieve replication benefits in project implementation and is a source of documentation, guidance, and metrics in project management and implementation practice (Crosman 2008.)

The PMI is defining that the strategic PMO enables strategic change in organizations. The PMI notes that there are different roles for different PMO's. The PMI explains that some are standardizing management processes related to projects and facilitating the allocation of resources and tools. The PMI adds that others act as a center of excellence, and yet others are targeting the project and program work to company strategy for the entire company. (PMI 2019)

Cunha and Moura define the PMO as an organizational entity with responsibilities for centralizing and coordinating projects in its area. In fact, a PMO can fulfill many different roles or functions within different organizations (Cunha & Moura 2014.)

Taylor says that each project-based organization looks for methods to plan, organize, direct, and guide projects to maximize their success in achieving their technical, time, and financial goals. One of the approaches that such organizations use to structure these management considerations is the PMO, which can benefit from standardization and the application of systematic policies and processes. Many companies with multiple projects have or are considering having a PMO, and such a community can provide support, documentation, and metrics related to project management practices. However, the scope of the PMO extends beyond standards, to leadership and achievements that are aligned with the business strategy (Taylor 2011, 139–151.)

Definition of the PMO

Andrews is stating that the PMO serves as a center of excellence that helps project managers to implement projects successfully by creating the necessary processes and methods for implementation work (Andrews 2014). Once the organization implementing project management methods and even taking the next step by establishing a Project Support Office (PSO) to support it, the road to a mature project management environment has just begun. Discipline is constantly changing and improving. Effective and complex project management is a work in process and will be so in the near future (Wysocki 2013, 503.)

One of the organization's most important contributions to the success of project management has been the Project Support Office. It is set up to support project teams and reduce the risk of project failure. The PSO has many different names and variations in mission, objectives, functions, organizational structure, and organizational placement. These can become quite overwhelming to those who are unfamiliar with the concept and its practice (Wysocki 2013, 503.)

The goals of PMO can vary in urgency and sophistication. They can be setting industry standards, which is a very proactive approach to carrying out business projects. Other less ambitious goals could be to show greater business profits, integrate project management into the organization, improve project management performance, develop project management recognition, be a competent and productive project team, implement a consistent, formal project management, or simply complete a current project on time and budget. Sometimes,

poor execution of key projects and/or a desire to stabilize active projects may highlight the need for a PMO (Rad 2001.)

Types and roles of PMO

The PMO has become a generic name for the organizational structures responsible for the success of projects, programs and portfolios at a certain level. It is critical for the PMO's success that this organizational mandate and the PMO's desired results are clearly formulated (Kaufman & Korrapati 2007.) In Peter Taylor's book, PMO has been defined as department or group that defines and maintains the standards of process, generally related to project management, within the organization and that links business strategy to the projects that such strategies require (Srivastava 2012).

Hill (2004) defines that the PMO's role is to help both the project manager and the relevant organization to not only understand and apply modern project management practices, but also to adapt and integrate business interests into the organization's project management efforts. Philbin states that the role of the PMO can be viewed in terms of the strategic and operational dimensions, and the framework provides scope and function, and the corresponding benefits of both. The author adds that it is estimated that the particular balance between the strategic and operational activities of a particular PMO will depend on the needs of the organization and the requirements for establishing the PMO. This should be taken into account when considering the location of the PMO organization, for example, whether it sits at the departmental, divisional or company level. The specific structure of the PMO is likely to differ from one organization to another (Philbin 2016.)

The PMO declaration describes the PMO's role: "Do the right things, in the right way, in the right order and with the right team". Five types of PMO are classically reported: departmental, special purpose, outreaching (supplier), external (customer), and business PMO (Srivastava 2012.)

Project Management Competency Center

Andrews defines that the project management competency center helps with staff development, training and certification. It can allocate project resources to specific projects and maintain the core repository of project management knowledge, skills and standards. Andrews adds that the PMO provides mentoring and coaching assistance/facilitation in planning and implementation of projects. Andrews emphasizes that the PMO's like this are

best suited for businesses with multiple business units with different roles and project types that require project managers with significantly different training, background, and subject area expertise (Andrews 2014.)

Strategic Program Office

Andrews defines that strategic program offices operate (SPO) at the executive level. The SPO's manage and convey the goals of major projects and programs, but do not lead individual projects. The author adds that PMO works as a project portfolio executive advisor. Andrews advises that these types of PMO's are best suited to multinational companies that can diversify around the world and demand project portfolio analysis and long-term planning input for strategic planning (Andrews 2014.)

Operational PMO

Andrews is stating that operational PMO controls priorities, planning, resource allocations, schedule and budget calculations, deliverables, and key milestones at the tactical level of the project. Andrews adds that it can influence by monitoring and prioritizing a number of smaller projects, especially if individual projects are below the strategic program office threshold or horizon. The project managers are managed under this umbrella directly running the projects. Andrews emphasizes that these operational PMO's are best suited for companies with multiple business units and doing similar projects or have adopted an approach in which PMO has a trained project manager reserved to coordinate project scope, cost and schedule elements (Andrews 2014.)

PMO Maturity Model

Pinto says that in the PMO, the level of maturity is due to how it can deliver added value to its customers and therefore to the whole organization (Pinto 2012). Based on Bookman, the PMO maturity should be evaluated in areas such as project estimation, strategic alignment, schedule management, cost management, communications, PMO and project governance, and project management skill sets. The author adds that there is no single answer for what people are looking for, but they need to know where they rank in maturity in these key categories, and they must align their maturity levels with your company's strategies and the sophistication of the projects the PMO is charged with (Bookman 2010.)

Pinto says that the first analysis may suggest that the maturity of the PMO should develop from an operational approach towards a strategic approach. A profound analysis might give

a different perspective on this process. In fact, PMO’s were created due to needs, but a large majority had a goal to get better results from projects developed by the organization. Pinto highlights that in recent years, although some of these initiatives have succeeded, matured and created a great added value. The author adds that others have again lost either their strength, their support or have been cut or some even have been terminated. Successful PMO organizations are constantly challenged to ensure that their practices are constantly meeting the needs of the organization (Pinto 2012.)

The following PMO phases represent (Figure 6) the progressive skills and functionality development that can be achieved to meet the needs of an organization's project management environment and related business goals. Assuming that the higher-stage PMO has already achieved the qualifications required for all lower-stage PMO’s. Therefore, if an organization wishes to establish a stage 3 standard PMO, it must also ensure that it has first met the qualification requirements for the 1st and 2nd stage PMO. It has also been suggested that the PMO may, at any stage, engage in activities at any level to meet the needs of the organization concerned, which is far more important than going through successive levels of qualification. In addition, it is critical to identify the approximate level of PMO qualifications that the organization concerned needs. Even an organization does not need to have a PMO in stage 5 (Hill 2004.)



Figure 6. PMO Maturity Levels. Hill (2004)

Stage 1: The Project Office

The stage 1 PMO is the basic unit of project management in a project management environment. A project office is created as a domain for the project manager who is responsible for successfully completing one or more projects. It offers the ability to ensure professionalism and excellence through the application of widely accepted principles and priority project management practices in every project activity (Hill 2004.)

Stage 2: The Basic PMO

The stage 2 or Basic PMO is the first PMO level that deals with a wide range of project monitoring and control. It provides the ability to provide total control and management of multiple projects relative to the performance of multiple project managers (Hill 2004.)

Stage 3: The Standard PMO

The Stage 3 PMO is an essential part of the continuity of the PMO's expertise, representing a complete and comprehensive PMO capability. While the Stage 3 PMO is still working on project management oversight and control, it brings a new focus to support that optimizes the performance of individuals and projects in a project management environment. Its scope ranges from managing multiple projects to multiple project managers and may include overseeing or otherwise targeting one or more program managers (Hill 2004.)

Stage 4: The Advanced PMO

The Stage 4 PMO evolves from the existing complete PMO ability and is therefore the standard (stage 3) PMO's "big brother". Its focus is on integrating business interests and goals into a project management environment. This means adopting common policies that can be applied to both project management processes and business processes. To use the term familiar to many professional project managers, an advanced PMO helps creating a "predicted" business environment (Hill 2004.)

Stage 5: The Center of Excellence

The Center of Excellence is a separate business unit within the organization and has responsibility for company-wide project management operations. The PMO functionality assigned to the Center of Excellence must focus on strategic business benefits throughout

the organization. While lower-level PMO organizations can also be assigned such tasks, it is most evident at this is the highest level of PMO (Hill 2004.)

Many PMO organizations are set up for a rather narrow purpose, but their scope grows over the years without expressly announcing a new mission. Over time, misalignments abound, and some in the organization act in accordance with their original mission, while others follow a broader scope.

PMO organizations are an important asset for large companies, so if your own is not generating the value you want, do not just ignore it or starve it into resources or passively lose your investment. Get intentional again to make it work. An effective recovery phase should only take a few weeks. It is refreshing not only for the PMO but for the company as a whole (Bookman 2010.)

Ramping up a PMO

Aziz is stating that the creation of a successful PMO must be initiated by understanding and defining what the PMO is doing for the organization. Aziz adds that Often PMO implements a strategy and delivers added value by leading the organization to the present state of the future. Before starting PMO planning and configuring, you should ensure that all of PMO's stakeholders know its meaning, the role and what to expect from PMO (Aziz 2014.)

1. The PMO should manage stakeholders' expectations such as senior management, project managers, project team members, operational managers, and anyone who has a positive or negative idea of PMO. Useful tool for PMO is the creation of a vision and strategy. The vision must have a flexible, concise and thoroughly described result. Typically, stakeholder involvement in vision creation guarantees success, commitment and support. The PMO strategy should include key success factors in the organization. It must strive to ensure that PMO is defined to support and develop the current direction of the organization. Many falls into the trap of wanting to set up directly a high maturity PMO and forcing the entire organization to adapt. The author thinks that is the way to failure (Aziz 2014.)

2. The PMO introduction plan should be developed for its implementation and ensuring that the plan includes, a transition plan, PMO leadership, stakeholder engagement, roles, and the definition of responsibilities and the way in which implementation is monitored and controlled. In short, treat your PMO setup in the same way as a project reference. The use of a steering committee is made up of representatives of the various units of the organization

would continue to help and guide in the strategy work, where PMO is ensuring that it has the necessary support from the highest level (Aziz 2014.)

3. Setting implementation targets as the PMO needs time to develop and improve its processes and strategic position. At first, The PMO must prioritize its efforts to programs and projects that promotes the organization's strategic directives (Aziz 2014.)

4. Running a pilot project and choose strategic goals that can be developed for the better and testing different methods and processes, gaining confidence in the processes that works. They can be used to select, prioritize, manage and implement projects that contribute to the achievement of the selected objectives. The aim of the pilot is to ensure that processes and methods work properly and if necessary, make changes (Aziz 2014.)

5. Complete the PMO ramp up and set up integration programs and projects and set the strategic goals (Aziz 2014.)

6. Allowing the PMO to complete the period, typically three months, and then perform a performance check to see the outcome (Aziz 2014.)

Based on Andrews the PMO should implement a project management evaluation tool to determine the effectiveness of the process implementation. Such tools may include audit assessments, project progress monitoring and project quality evaluations, as well as project trends and analysis are supported. The author say that the PMO maintain information in their repository that provides accurate information about project performance (Andrews 2014.)

3 Research methodology

This chapter outlines the research strategy, firstly exploring the basic principles of action research. Finally, presenting description for service design methods and the related theoretical background. This thesis is action research and it started when there was only reasonable idea of the problems available at case company. Typically, action research (AR) theory suggests that the AR process starts with a notion in the practitioner's mind that a change in practice is justified (French 2009).

After fifty years of development work, action research is still the umbrella term for action aimed at promoting change at the group, organizational, and even social levels. Even though most action research professionals agree that they are involved in institutional or personal

constraints, they emphasize their pressure on various aspects of action research to remove these constraints (Dickens & Watkins 1999.)

Action Research Process

After gathering the data, the members of the action research team analyze it and then come up with possible solutions to the problem identified. In addition, the team must understand the information and present this meaning to the organization. Feedback to the community can act as an intervention itself, or action researchers can take more structured actions that bring about changes to the system. Interventions can be considered experimental because members of the action research team test the effects of the changes, they make next by gathering more information, evaluating the results and reformulating ideas or redefining the problem in the system.

Action researchers continue through this cycle until they have completed the problem they initially recognized. Possibly performing one cycle will solve the problem adequately; however, the team is likely to go through several iterations to identify and solve the problem before the problem is both correctly identified and completely resolved (Dickens & Watkins 1999.)

3.1 Research Strategy

The thesis was implemented as an action research. The action research examines and attempts to change existing practices. Research has been used to find solutions to problems - whether technical, social, ethical or professional. It is important that practically active people, i.e. the practitioners, are actively involved in the research (Kuula 2019.) The best result from this thesis point of view will be achieved by combining theoretical knowledge from strategy, project portfolio management, a PMO and service design methods into action research.

Organizational project management refers to the alignment and systematic management of projects, programs, and portfolios to achieve strategic organizational goals, and in this context, the PMO plays an important role (Cunha & Moura 2014.)

Service design methods have been a big part of this thesis structure. The methods will be used in creation of PMO concept and more precisely PPM tools. The goal of service design is to create customer or people-oriented solutions that make the service experience feel

logical, desirable, competitive, and unique to the user, and increase innovation and commitment to companies and institutions in developing and delivering services. Services have become multi-channels. They are experienced and consumed in person, online, or interact with robots, such as independent driving (Miettinen 2016.)

Service design combines the use of different practical design and design research methods, design model and different visualization techniques, combining them with the views of different stakeholders during the service design process. Service design refers to the concretization of abstract content into one that can be easily shared, understood, discussed and prototyped together. It's about doing, doing, and learning through practice. Service planning encourages you to try and fail early. Focusing on a repetitive cycle of user engagement, using templates and cheap prototypes, and evaluating results in the development process leads to customer-oriented and usable service solutions (Miettinen 2016.)

Definitions of Research Methods

The following chapter describes the main methods that were used during the PMO concept creation. In addition to these methods also other methods have been tested and used during the research. The Chapter 4 provides the details from all of the service design methods that were used during this research.

Co-Design Workshop

Design workshops are a form of participatory design consolidating creative co-design methods into organized sessions for several participants to work with design team members (Martin & Hannington 2012, 62.)

Surveys

Surveys are a method of collecting self-reported information from people about their characteristics, thoughts, feelings, perceptions, behaviors, or attitudes (Martin & Hannington 2012, 172.)

Stakeholder Map

Martin & Hannington (2012, 166) say that Stakeholder Map helps to visually consolidate and communicate the key constituents of a design project, setting the stage for user centered research and design development.

Personas

Personas consolidate archetypal descriptions of user behavior pattern into representative profiles, to humanize design focus, test scenarios, and aid design communication (Martin & Hannington 2012, 132.)

4 PMO implementation process

This chapter contains the concrete results of the work. The chapter will deepen the understanding of design and implementation phases of the case company PMO, which lasted two years, starting in April 2017 and was finalized in March 2019. The results consist of the PMO concept model developed for the case company, as well as the project portfolio management methods and tools that will be utilized in the company's development project portfolio management process. The PMO concept work will be divided into phases required by case company project management method. The person who carried out the research acted as PMO Lead during the entire introduction process. During the process large global companies have been benchmarked as well as organizations from the municipal sectors.

Project management offices are well established in the telecommunications, aerospace and defense industries, where high value projects have long been the norm. The concept is gaining popularity in other fields as the size and importance of IT projects grow. Ideally, such an office is responsible for developing and maintaining project management best practices, standardizing templates for critical project management deliveries (charters, division of labor structures, change management processes, etc.) and coordinating projects across the enterprise or division. Although the PMO usually acts as a central office that coordinates the various project portfolios and shares its expertise, it can be organized either as a centralized function that serves the entire organization or can be integrated into each business unit. The most appropriate design depends on your specific industry and the characteristics of your organization (Rosenfeld 2005.)

The PMO acts as the engine for development and project implementation. Boukhari say that the PMO should be involved in the design work and monitoring of operations to ensure the compliance between the project and the requirements. As part of PMO, it should also involve experts (SME). Therefore, there must be technical people in the PMO that reduces the gap between project managers and operational departments. Typically, subject matter experts are inside or outside the organization and can participate in specific projects (Boukhari 2016.)

The PMO is accelerating the process of continuous improvement, risk identification and software development and cost management through project management methods. Implementing best practices in project management has a greater impact on the success of project on time and on budget (Kaufman & Korrapati 2007.)

Implementing a PMO will help to improve project success in terms of scope, cost, schedule, and customer satisfaction. An organization could choose a PMO simply for excellence in performance and profitability. Nevertheless, the organization is a good candidate for the PMO if the implicit and explicit costs of supporting expelled projects are higher than the organization is prepared to accept. The PMO can also facilitate the improvement of organizational project management skills (Rad 2001.)

As mentioned earlier in chapter 1, the case company PMO is a virtual service organization, which provides project portfolio management support, methodological support, performance tracking and evaluation support and also direct project and program support for development initiatives within the company.

4.1 Project Management Methodology

At first, introductory section describes the project management methodology used by the case company and then describes different phases, phase deliverables, and decision-making gates. With the case company project management methodology, every project is managed in a consistent way from project idea to project closing. It describes the stages of a project's life cycle and defines roles with sufficient precision so that the various stakeholders in the project know their own responsibilities and tasks. Figure 7 illustrates the case company PM method:

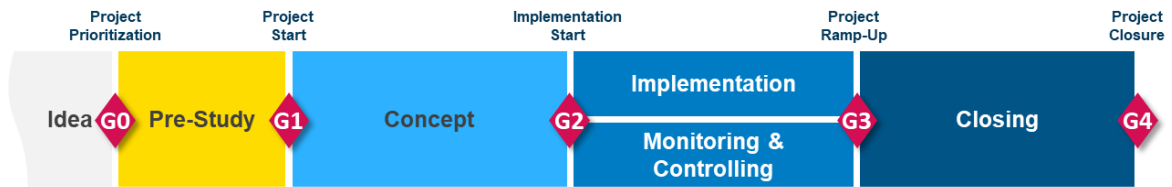


Figure 7. The case company project management methodology

PM method gives you clarity and placement in project implementation. It includes project-related decision-making processes (Stage-Gate model) as well as a pragmatic guide with document basics that allows all projects to be run uniformly. A basic understanding of PM method helps the people understand how to transfer and apply methodology to their running projects. Hence, it will be easier for them to benefit from the subsequent support sessions.

It is particularly important that the PM method is universally applicable, meaning that all types of projects can be run in accordance with the same principles and practices. When all projects are comparable, the company is able to lead them uniformly.

The PM method must be used when a new project candidate is initiated or an ongoing project needs project management support. The case company PM method has following phases and stage-gates:

Stage-Gate Model

Idea phase and Gate 0

The information gathered in idea phase is used to determine a project's feasibility and preliminary approval prior to moving into the pre-study phase. Project candidate prioritization is performed at this stage by the PMO.

Pre-Study phase and Gate 1

In the pre-study the project idea is drafted, and the feasibility of the project is checked. The main problem should be identified and feasibility of the idea (no financial or technical constrains) validated. Project stakeholders should be identified and required resources allocated to project team. Classification template gives the perspective on how demanding the project candidate is. Project objectives and goals should be defined, before finalizing project description and project proposal for start approval.

Concept phase and Gate 2

In the concept phase the project is planned more precisely. Kick-off meeting should be organized including relevant persons onboard. Project organization will be nominated with detailed project roles and clear responsibilities. Detailed schedules and a milestone plan with accurate work packages or sprint plans will be created. A budget for the project and set up cost principles will be aligned in business case review. Necessary resources will be allocated with department line managers. Clear communication to stakeholders, project sponsor and project steering group is a key to success. Supportive functions such as IT, security and procurement should be activated and informed of properly. The detailed project plan should be finalized and approved for project implementation.

Implementation phase and Gate 3

In the implementation phase the project produces the planned results of the project. The project team responsibilities and duties along with resource needs will be redefined if needed. Execution starts according to the approved plan. The project could go back to concept phase if the project needs more planning time. It is essential to set up risk and change management procedures according to plans. The project provides status review reports in which the deviations in cost, schedule or scope are reported. Status report is a useful tool in every project phase. The detailed project plan should be updated and approved for project closing.

Closing phase and Gate 4

In the closing phase the results of the project are tested and utilized by the project team, however, the receiving organization is supporting procedures strongly. Evaluation of the project deliverables will be realized at this phase. The project team ensures that the stakeholders are aligned with the project results. The project will be handed over to the business organization after milestone is approved. Project final review should be organized, where final report will be presented including lessons learned from the project. Project documentation to be archived and project team members return to its business unit.

4.2 Idea phase

This chapter describes the origin of the PMO idea and the process that followed. The idea arose when the case company decided to implement new investments which require changes in processes, working methods and daily practices. In order to be assured of the capability of the new hardware receiving organization, a centralized concept was quickly needed to support change management process. All this triggered an idea of PMO.

After creation of the PMO idea, the actual work started at a fast pace mode and the closest people were fully supportive towards the idea, although at the beginning the situation was very challenging, and the PMO was not well known in the organization. Typical small work improvements were classified as projects although individual persons were improving their own personal work.

The management support was clearly not enough, even though the PMO lead was selected by the PMO business owner and project sponsor while the whole PMO stakeholder network was supportive towards PMO development. Some of the supporting department development teams were involved with a good attitude and continued in the long-term when PMO introduction was developed further.

After a while, a subject matter experts began to prioritize their daily work ahead, so the PMO lead had to act quickly to keep up with the goals of the PMO concept. It was time to get support from the PMO sponsor and with a little escalation, project could continue without major challenges. Through the challenges, the company got the necessary PMO seeds sown and the case company management team became enthusiastic about the topic, so it was decided to organize a PMO management team to support the introduction of the PMO.

The members of the executive team were first appointed, after that it was decided to hold a steering meeting every two weeks to support PMO set up and to provide guidance when needed. The role of a steering group was to provide effective and timely decision making and support, to enable the success of the PMO set up.

PMO Sprint Plan

The PMO had to divide deliverables into appropriate work packages, taking into account the general principles of change management. Typically, change management is the process of continually renewing an organization's direction, structure and capabilities to serve the ever-changing needs of external and internal customers. Mastering strategies for managing

change is today more important because the rate of change is faster than ever in history (Moran & Brightman 2000.)

Figure 8 describes the PMO sprint plan:

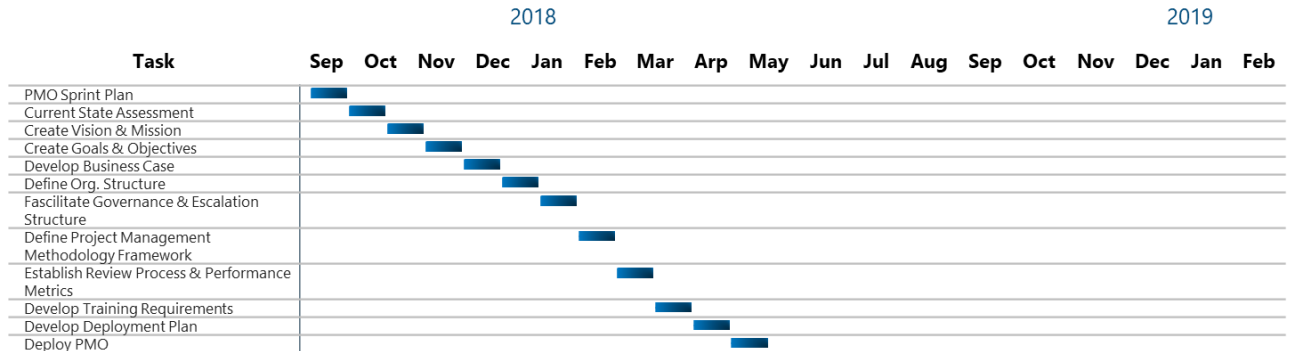


Figure 8. PMO Sprint Plan

After the creation of the PMO sprint plan, the project continued naturally with the following steps. First, it was described to the management team what is really a Project Management Office and what it should do. At the same time, the role of the PMO was strongly emphasized, as traditionally the implementation lasts for years and the sponsor’s support for a PMO setup is almost irreplaceable.

In addition to the Steering Committee team, PMO core team members were selected and they were proposed to share project-related information with other department’s key stakeholders. This proved to be a valuable way for the case company to share information across departmental boundaries and also highlight valuable lesson learned after project closure.

PMO Scope

This chapter explains the scope of the case company PMO and how it was introduced and developed after the company made the decision to introduce a PMO. The first step when defining the scope was to implement the current state assessment. Following chapter provides details how PMO scope was defined and current state assessment conducted.

Many companies with multiple projects have or are considering a PMO location, and such a community can provide support, documentation, and metrics related to project management

practices. However, the scope of the PMO extends beyond standards to leadership and achievements that are aligned with the business strategy (Srivastava 2012.)

Current State Assessment

The PMO decided to monitor internal development projects from the case company departments and subsidiaries, identifying 300 ongoing initiatives within all sites. An interesting challenge was that company sites had different divisional categorization of initiatives. There were different types of projects from business process, hardware investment, software, engineering, facility, R&D and quality improvement.

In the case company projects rarely meet deadlines, targets nor are the results used. Projects typically fail because of poor project management and target setting. As described in chapter 1.3, almost 90% of the internal development projects were delayed. Over 80% exceeded the approved budget and 53% of the final project evaluations were not used for future projects. In-house development projects typically failed due to project management issues, poorly defined objectives, planning issues or issues with resources.

Current state assessment work was coordinated by Pilpola and she was analyzing the status through her thesis. The aim of the current state analysis was to create an understanding of company development project practices. In total of 14 company employees participated in the interview. Interviews were held in February 2017 before the official PMO deployment. The interviewees were selected based on their experience and job descriptions in the case company (Pilpola 2017.)

Participants in the interview were in different positions in the Case company. Typically, the participants were operative managers, except for one of the interviewed, who was a member of the executive steering committee. Top management and middle management have a different approach to project management, which led to interviews with employees in different positions. The company senior management focused on the overall performance of projects and their impacts. The middle management applied for a functional approach to measurement and project management. Interviewees offered different insights on how company development projects could be managed and how each development project should be coordinated on a case-by-case basis (Pilpola 2017.)

The study found that the current management of process development projects within the case company was inconsistent and therefore the company needed new tools and methods to

develop leadership. The main challenges of case company development projects were lack of PM knowledge in project and program level, systematic communication is nonexistent between the departments, and lack of visibility towards project portfolio (Pilpola 2017.)

Brainstorming the PMO

The brainstorming session was decided to be held before the actual PMO kick off (April 2017). Development engineers and managers were invited from 19 different organizations units. The decision to focus on development persons was based on rational thinking, not to involve actual product makers at this point when they had to focus on product creation in the near future.

The first 30 minutes people were introduced to the idea of PMO and what it should do. After people had an idea of the PMO, session continued. Brainstorming session provided lot of good inputs on the design work and built a solid foundation for development.

People proposed the PMO to consist of senior advisors who have strong experience and low change resistance over new process changes. The PMO should also attend to case company's global work, which means that PMO lead must attend to global meetings to spread the message to also other locations.

PMO Charter

The PMO charter is a tool for defining a development approach and limiting the expectations of stakeholder management to a new possible organization. The PMO needs to be presented with vision, mission, goals and information, as well as the roles and responsibilities of the PMO and its stakeholders (Andrews 2014). It is important that the level of mandate and charter are clearly articulated by the key management entities in order to minimize cultural resistance to the PMO. The PMO's at all levels must be chartered to execute and communicate in terms of outcomes and results, both at the project/program level and at the business results level (Kaufman & Korrapati 2007.)

Chartering a PMO requires executive support. Operating one, however, requires support from operative project managers. Training is a powerful incentive for skeptics- and helps the PMO to better serve them (Alderton 2013, 02.)

The PMO charter was created to help the team to focus on the right things right from the beginning. The PMO charter summarizes key objectives, deliverables, scope statement,

implementation costs, benefits, impacted employees, PMO resources, critical interdependencies and main risks. The consistent idea is becoming more concrete after chartering the PMO. The PMO lead continues the work preparing PMO charter for SteerCo approval.

The progress towards Pre-Study phase

The PMO concept design is progressing at global level. A unified roadmap was still needed to be validated. Portfolio intake was managed with excel file. Meeting structure and cycles were agreed and there was clear alignment between all the company sites.

4.3 Pre-Study phase

This chapter describes the process that took place after the approval of the PMO pre-study. The purpose of the pre-study is to create vision and mission for case company PMO and to set feasible objectives for PMO and its development. During the pre-study phase the PMO team uses Co-Design Workshop to define project categorization, project prioritization and decision-making process for PMO and additionally, describe stakeholder's expectations towards the PMO concept.

The specific organizational and strategic context must be considered when implementing or reconfiguring a PMO. Cunha and Moura believe that this work may help to clarify the state of the art in PMO's and indicate new topics for future research (Cunha & Moura 2014.)

Each company has the opportunity to introduce a PMO that provides project management resources for individual projects or serves as a support and best practice research center. If your project management capabilities are limited elsewhere in your organization, it makes sense to pool resources into a centralized, coordinated department. If a corporate culture or business model encourages project management skills across the organization, a project management firm is more effective than a situation room (Rosenfeld 2005.)

Vision and Mission

Firstly, after pre-study approval (gate 1) was to gather a supportive development team and start the creation of the vision and mission for the PMO. The vision and mission were planned to support and align corporate vision and strategy. Secondly, what improvement PMO would bring to business? The vital aspect was to get a real user-friendly story behind the terrific idea and by that it could create credible user experience behind PMO. Short term

target is to increase transparency within the case company's development project management activities.

The following vision and mission were created to support the PMO storyline:

“Our vision is to position the case company PMO to be the benchmark in its industry. By continually improving the company's project management capability, the PMO directly took part in expanding the company's competitive advantage.”

“Our mission is to provide leadership to the project management standards within the case company, enabling people to work in an efficient and effective project environment.”

Goals and Objectives

The case company PMO is a centralized business service that provides project management business practices, processes, and support services. This cross-functional team consists of experts who are skilled in providing those services. Reporting to executive management level independent of other functional groups. Additionally, providing support directly to the portfolio, program and project managers and their staff within the company.

The PMO is accountable for developing, implementing, and monitoring the consistent application of a project business management methodology across the company. It integrates the application of project, program and portfolio management business practices with the operational business practices throughout the company by coaching and training.

The following list describes PMO design principles in the pre-study phase:

1. A functional service organization created for the specific purpose of supporting the change initiatives
2. A coordinated, centralized approach to synchronize, support and monitor project progress across the company locations
3. A common and structured way to prioritize and approve new development projects
4. A key to tracking the value delivery of ongoing and completed initiatives
5. Central support team with mandate to advice top management in key project decisions

At this stage, it is clear for everybody that the PMO team keeps a decision log and escalates deviations if necessary. Lists new project candidates to portfolio and organizes the strategic prioritization session. It also presents stop or postponement indication to projects and recommends phase approvals to project sponsors.

Additionally, the PMO highlights gaps to fulfill strategic aims, facilitates issue escalations, steers business architectural decisions which are relevant to the case company. Highlighting the risks and prepares solution options throughout full portfolio and shows harmonization gaps/issue where two sites are fighting.

Finally, the portfolio customers are typically satisfied if the budget was used, if the projects reached the finish in time, without exceeding their target budget, and if the projects were able to create a highest value in a short period of time (Agyapong et al. 2016.)

Stakeholder expectations

To ensure right project execution in this important change, site stakeholders has the following expectations towards PMO. They expect to have full transparency in terms of project targets and objectives. Key performance indicators (KPI) need to be clear, effective and aligned with company strategic KPI's. Project impact value should be calculated clearly along the business case validation process. Every project must have measurable deliverables before the actual project approval. Project scope and impacted departments need to be identified.

Project costs and potential investment need should be included to monthly Steering Committee, only mention if exception from plan. Timeline including phases and major milestones, especially go-live date should be reported on a monthly basis. Project organization including number of internal/external resources and names of "bottleneck resources" should be addressed as well.

Top risks and issues should be reported in bi-weekly mode and upcoming decisions should be highlighted on one-month timeframe. Project interdependencies to other topics/risks with concrete due dates and responsibilities for follow up should be monitored systematically.

A project management method should be used in every initiative. All strategic projects are quality reviewed by PMO. Phase or major milestone approvals for each project are validated with PMO before reporting to SteerCo. The value tracking process should be in place to

ensure projects deliver the promised benefit and value. Governance structure for escalation for each project could be individually defined.

Communication should be informed to stakeholders and management members after SteerCo and if major decisions/changes are made. Change impact analysis and other change management related topics and escalated decisions are well prepared and easy to follow-up in project SteerCo or PMO SteerCo. Project quality reviews will be performed by PMO, where it makes sense. The workshops that are focusing on project lessons from the lifecycle need to be implemented after project implementation phase.

Figure 9 presents the PMO process after Pre-Study phase:

Project	100% transparency	Hi5 is lived	Quality reviewed (Score; 5 = high)	Phase release recommendation	Value tracking process	Clear escalation route in project	SteerCo in place	Health Check	Lessons Learned fed to other projects	Change Management related topics
Project 1			declined							
Project 2			Oct 17							
Project 3		Yes	Yes							
Project 4			N/A				N/A			
Project 5			Oct					Yes		
Project 6			Yes				Yes	Yes		
Project 7			Yes				Yes	Yes		
Project 8			Yes				Yes	Yes		
Project 9										
Project 10			Oct 17							
Project 11			Yes							

Figure 9. Change Impact Analysis Chart

Co-Design Workshop

PMO Co-design workshop was conducted at case company premises on May 2017. Twenty persons were invited to the workshop initially. 18 persons were attending to two-hour workshop. The attended persons were Heads of departments, project leaders or PMO project coordinators, along the PMO lead. The attendees were selected based on their experience towards development project management.

Key items for this co-design workshop was selected to be project categorization, project prioritization and decision making. The facilitators of the workshop decided that the workshop should not be recorded or transcribed.



Figure 10. Co-Design Workshop

After data collection from the workshop, materials were collected and the data was carefully analyzed with Microsoft tools such as Visio, Excel and PowerPoint and results were taken into account when designing the PMO concept and its detailed tools.

The progress towards Concept phase

The PMO concept design was finally proceeding at all levels. The PMO vision, mission, objectives and future targets were defined at this stage. During the stage the stakeholder expectations were collected, and co-design workshop added value to project categorization, project prioritization and decision making.

Data collection meetings was held with main department heads. The stakeholder's feedback towards PMO was gathered in order to receive constructive feedback from key stakeholders. PMO related meeting was invited but invitations are pending as long as there was alignment between the different sites.

The PMO team agreed that sprint plan for all the sites will be created. Concept for PMO approval will be made in two releases. After PMO start approval, the concept will be communicated towards case company site management and PMO stakeholders in October 2017.

4.4 Concept phase

This chapter describes the process that took place after the approval of the PMO concept phase. The purpose of the concept phase is to develop PMO structure, roles and responsibilities, governance and escalation structure, meeting structure and communication plan for case company PMO and to start piloting project quality reviews at the same time. During the concept phase the PMO team uses following service design methods; swim lane charts, stakeholder map, personas and survey to define structure and collect valuable feedback from impacted stakeholders.

An appropriate portfolio management governance structure is crucial for the successful strategy implementation process. In some cases, different organizations have different systems for portfolio data collection and reporting, and it is imperative to identify the processes and people involved before purchasing any technology solution. The clear roles and responsibilities of everyone in the organization who is involved in portfolio management also contributes to the smooth operation of the portfolio management system (Agyapong et al. 2016.)

“A PMO is a complex multi-dimensional entity. The design of a new or modified PMO is based on a large number of design choices. Likewise, the description of an existing PMO is based on a large number of variables” (Cunha & Moura 2014.)

PMO Structure

Agyapong et al. say that setting up a strong portfolio management function, whether it is a separate department or a multifunctional entity, will generally require strong leadership. Agyapong et al. adds that leaders need a clear understanding of what value portfolio management can help guide their strategy implementation, and to manage its creation (Agyapong et al. 2016.)

Once the structure to PMO was created on three levels, providing full structure on global and site level with on-demand support on the main department level. It was agreed that the

PMO monitors and manages actively projects that are rated as the highest priority in the group. The PMO core team will consist of representatives from all company sites enabling a balanced cross-site project management approach. Global PMO will be rolled out in the first phase, Site PMO in a second phase and department PMO in third phase. Approval decisions recommendations of new global and site level projects are done in the global PMO to enable better visibility of the entire project portfolio.

A long-term goal plan is to create a new leadership platform to support the project portfolio tracking, developing portfolio management practices and managing project prioritization. Lastly, implementing the continuous improvement mindset, which is one of the most concerning topics when thinking about a case company's future. The implementation organization of the PMO is described in this Figure 11:

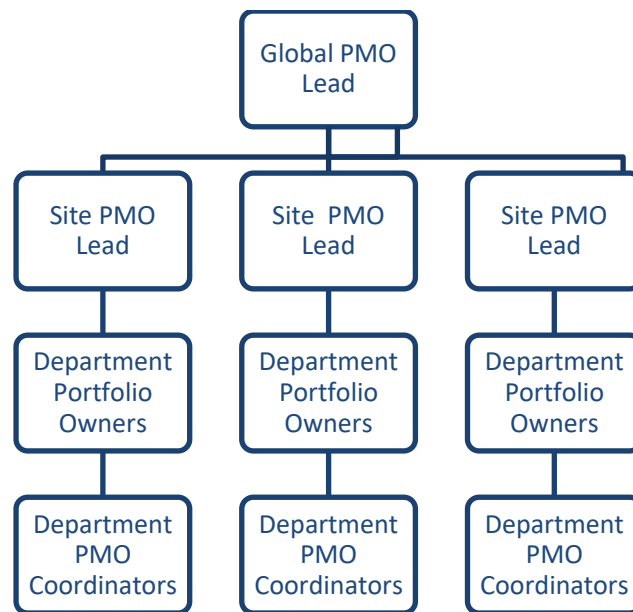


Figure 11. Functional PMO organization structure

Global Level

Global PMO will report to SteerCo consisting of group top management team. It manages global projects and initiatives that are significant and impacts global cross sites. Budgets, project plans and timelines are primarily defined by Finance executive.

Global PMO covers all globally important projects, which fulfill two or more of the following criteria:

1. High strategic importance
2. Significant financial investment and/or impact
3. Cross site influence and dependencies
4. High resource needs

Local Level

Site PMO will report to SteerCo consisting of site management team. It manages local projects and initiatives that are significant but impacts only local business unit. Budgets, project plans and timelines are primarily defined by Business Unit (BU) heads. The site PMO approaches based on locally agreed practices with limited support from global PMO.

Site PMO covers all locally important projects, which fulfill two or more of the following criteria:

1. High/medium strategic importance
2. Significant/high financial investment and/or impact
3. Cross department influence and dependencies
4. High resource needs

Business Unit Level

The department PMO will report to SteerCo consisting of department management team. Business unit specific initiatives that are managed and impacting the business unit only, such as budget, resourcing and project management has been handled by the business unit only. The department PMO is locally adjusted to ensure that optimal support is provided with right level of control.

The department PMO covers all departmental projects, which fulfill two or more of the following criteria:

1. Medium/Low strategic importance
2. Medium/Low financial investment and/or impact

3. Department influence and dependencies

4. Low resource needs

Projects with IT

Projects with IT portion should by default be managed on a global or site level. If the selected IT solution approach during pre-study phase is straight forward “off the shelf” project with no bottle neck resources and no new software components and only one IT team affected, the project can be “downgraded” to the business unit level. This downgrade needs to be accepted by an IT Business Service Manager.

Current IT team made alignment to towards PMO as IT has existing governance model and collected portfolio list which is highly interested by the PMO. A workshop for first release concept approval was organized. The PMO introduction, meeting structure, specific agendas and PMO role charters needed to be created in the workshop.

Roles and Responsibilities

What really is beneficial for the case company is that there are clearly defined roles and responsibilities for personal levels. Too many times companies have experienced that there is a name in the project organization chart, but the person is not available for the project work. Table 2 describes the created roles and responsibilities for PMO stakeholders:

Title	Role	Responsibility
CEO	PMO Sponsor	<ul style="list-style-type: none"> • Ensures that the PMO has the necessary resources and funding for optimum operation • Resolves issues related to the PMO • Approves PMO’s initiatives
PMO SteerCo	Steering Committee	<ul style="list-style-type: none"> • Resolves project issues • Provides project directions • Approves project deliverables • Approves project funding • Approves project time frame

		<ul style="list-style-type: none"> • Reviews project's alignment with business' goals
PMO Lead	PMO Manager	<ul style="list-style-type: none"> • Leader of the PMO, is responsible for managing specific projects and PMO operating models • Provides specified perspective in the PMO discussions and meetings.
Project Lead	Project Subject Matter Expert	<ul style="list-style-type: none"> • Ensures project compliance with PMO's project management standards • Ensures timely delivery of project goals • Escalates project issues when they cannot be resolved within the project • Ensures flow of communication with the PMO
PMO Coordinators	Project Subject Matter Expert	<ul style="list-style-type: none"> • Assists the project managers with project completion
Department Heads	Client	<ul style="list-style-type: none"> • Ensures effective communication of the expectations within the PMO • Supports the PMO when dealing with projects taking place in the department
Business Staff	End Users	<ul style="list-style-type: none"> • Provides feedback on PMO services • Is actively involved when required by the PMO

Table 2. PMO stakeholder groups

New role called “Change agents” were strongly considered at the concept phase, however there were not enough trust that selected agents would commit to PMO development targets, without proper objectives. The purpose of role “change agent” was always to be on top of progress, spread the word-to-mouth message, only without profit responsibility.

Swimlane Chart

The PPM swimlane chart describes the lifecycle of the development project at a general level. A swimlane chart introduces the high-level perspective by visualizing the PPM process easily. Additionally, it was convenient tool to introduce PPM process in training purposes. The stakeholders understand the procedure immediately when they see created PPM swimlane chart. Following Figure 12 is illustrating the high-level PPM process at case company:

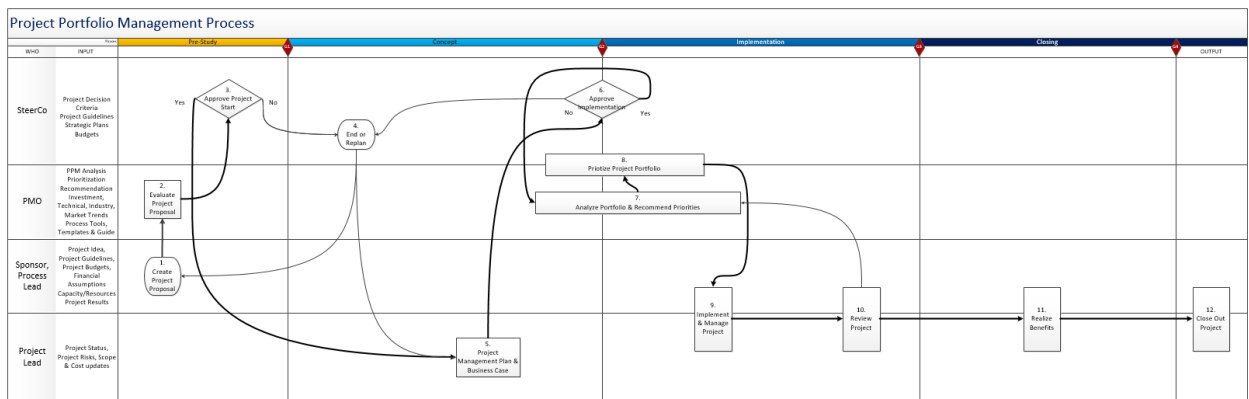


Figure 12. Project Portfolio Management Process Chart

Stakeholder Map

Boukhari defines that the PMO can be a function which provides a stakeholder management facilitation services between different parties (designers, contractors, consultants and control management), as a key factor in the success of the project is the transparency of the entire board. Boukhari adds that visibility enables timely decision-making due to the success and benefits of the project. Nowadays, one of the leaders in the challenge is to get accurate information when it matters. The author emphasizes that the PMO should understand that challenge and strive to create a project management responsibility culture for all levels. Boukhari is stating that high-performance organizations understand the value of project management and create a mindset of project management. It is important to implement PMO, which tells project managers the decisions and for senior management about the truth from projects in a timely manner and clearing the way for the talent development (Boukhari 2016.)

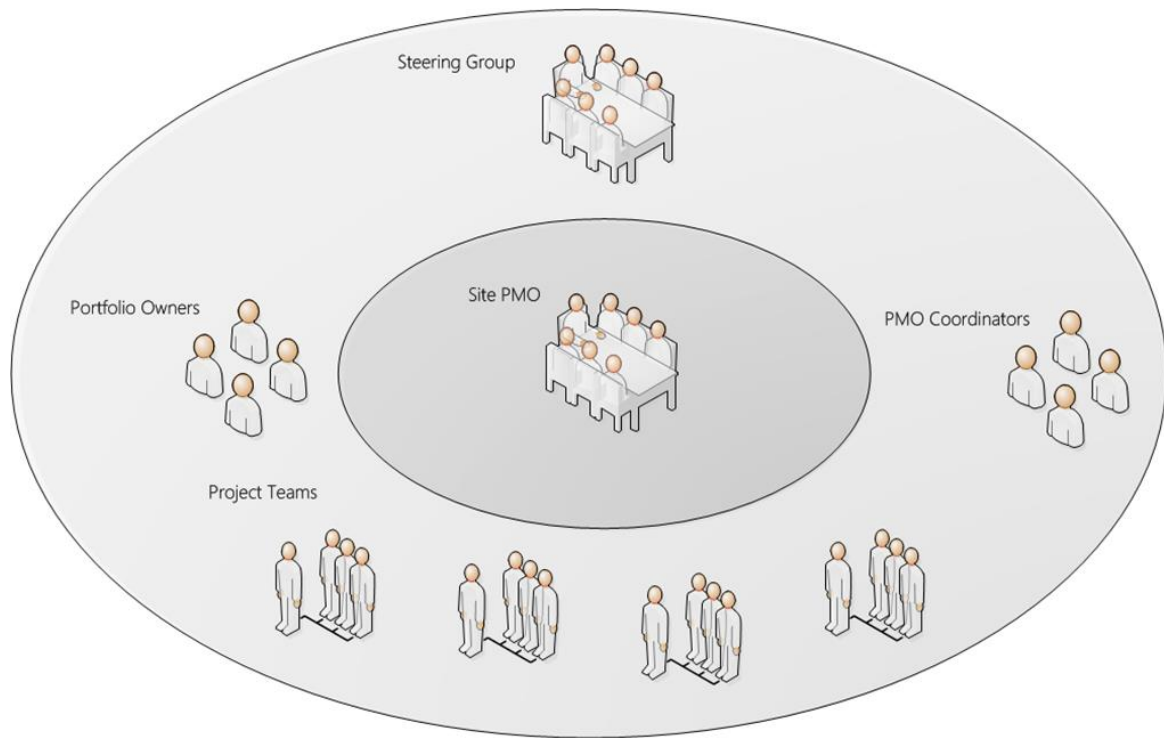


Figure 13. PMO Stakeholder Map

A stakeholder map was a useful tool to visualize all the impacted stakeholders and focus efforts to gather valuable feedback directly from the key stakeholders. At the same time the tool provides a map for communication within the PMO stakeholders. Once the illustrative stakeholder map was created, it was easier to sell the idea to the steering group who makes the final decision in the end. If their attention can be bought by visualizing key stakeholders in a simple and understandable way, it makes design work even easier to continue.

Personas

The aim was to gather useful information about PMO characters who are part of the new process. To gain understanding more deeply about service users, personas were a useful tool to be used. It gave information about their needs, desires and how they would see PMO as a service point if they would decide the outcome. The data was collected from seven project leaders who attended to PMO pilot, asking who they are. The reasons why they would use the PMO service. How they wish PMO would solve their issues. What kind of services PMO should offer in the future and what their current challenges at work are.

The following user groups were standing out from the crowd when forming persona templates:

- User 1: 20-30 years/old male, less than 5 years of project management experience. Single and no kids. The case company has no centralized process to manage development projects.
- User 2: 30-40 years/old male, 10-15 years of project management experience, Married and kids. Facing challenges with systematic communication.
- User 3: 40-50 years/old male, 20-25 years of project management experience, IPMA B certified. Married and kids. Facing challenges with the decision-making process.

Governance Model

Agyapong et al. is stating that when a portfolio function is reported directly to top management, better results than any other organization are more likely to be achieved. In addition to this, the portfolio function must have the correct governance mechanisms and rules developed to make it work without problems. Typically, organizations have their own portfolio management, but portfolio decisions require a review of many stakeholders, prior to approval. The governance shall be empowered and incorporated in the process of ecosystem; Agyapong et al. says (Agyapong et al. 2016.)

Figure 14 illustrates the case company PMO governance model:

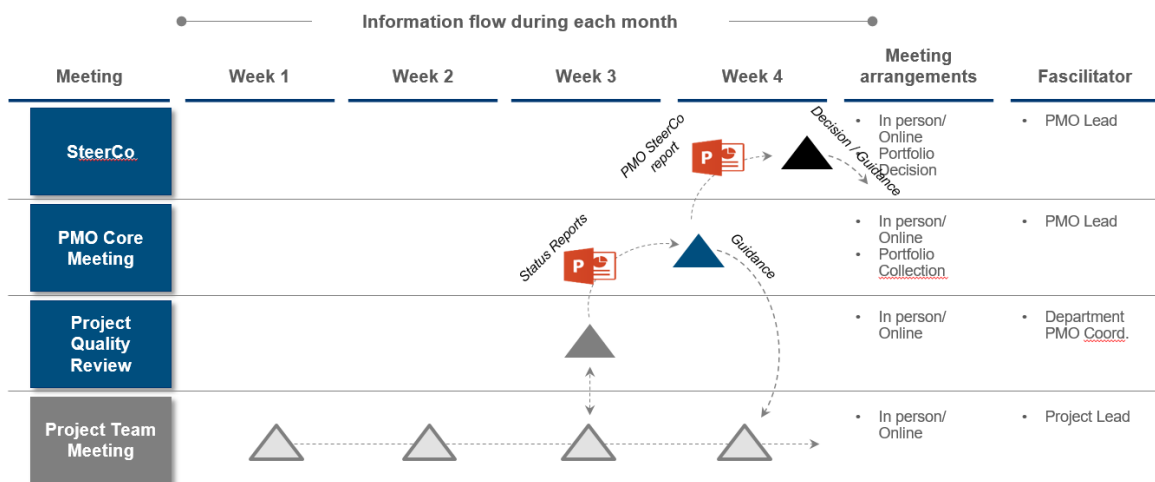


Figure 14. PMO meeting cadence

The PMO governance was conducted at three levels. At the project level, both operational matters, technical and commercial issues were handled with. Project deviations were

escalated to the Core team, which escalated them to Portfolio SteerCo. The Core-team focused on making tactical suggestions for SteerCo and approves project deviations within its approval limits. The SteerCo resolves project issues, provides direction, directs project scope, schedule, cost and reviews alignment with business' goals.

Meeting Structure

Table 3 provides details on case company PMO meeting agenda structure, which was designed based on PMO governance model:

PMO Steering Meeting
Purpose
To steer and monitor the progress of the most important project within the site and to act as the highest decisions making board. Steering committee also approves the decisions made by PMO and takes actions based on the recommendations of the PMO team.
Standard Agenda & Responsibilities
Review actions taken by PMO in previous cycle 10 min
<ul style="list-style-type: none"> • PMO to provide a list of key decisions made (in alignment with the agreed degree of authority) • Share recommendation on gate decisions done/planned on projects or programs
Review key exceptions in progress 15 min
<ul style="list-style-type: none"> • Review and approve corrective actions • Allocate additional resources (if feasible)
Make decisions escalated to the steering committee 15 min
<ul style="list-style-type: none"> • Resource conflicts and issues • Significant project delays
Review list of changes to project portfolio 10 min

<ul style="list-style-type: none"> • Make a decision based on the recommendation of the PMO team • Veto PMO decisions and recommendations if needed
Agree actions (if applicable) 5 min
Wrap-up 5 min
Input
PMO SteerCo report
<ul style="list-style-type: none"> • High level progress per initiative • List of key exceptions across initiatives • Suggested corrective actions • List of key decisions required
List of decisions made by PMO
<ul style="list-style-type: none"> • Decision 1
List of changes to project portfolio
<ul style="list-style-type: none"> • Recommendation by PMO
Output and Decisions
Approval of the project progress
Approval of the decisions made by PMO
Approval of the new projects
Decisions regarding escalated issues or resource requirements
Meeting rules

- Be on time
- Come prepared
- Secure your input to others
- Mobiles muted
- Be actively engaged
- Raise any concerns or issues
- Dedicate to decisions made

PMO Core Meeting

Purpose

To review the weekly progress across the PMO project portfolio, in which issues, interdependencies and key decisions are identified. To make recommendations regarding ongoing and new projects.

Standard Agenda & Responsibilities

Review progress per project | 10 min

- Identify deviations

Make decisions regarding issues from project teams | 10 min

- Text

Review list of new projects and charters | 10 min

- Make recommendations to SteerCo

Review updates from project quality reviews | 10 min

- Text

Review upcoming PMO / SteerCo meetings | 5 min

<ul style="list-style-type: none"> • Arrangements and responsibilities
Review upcoming communications 5 min
Agree actions (if applicable) 5 min
Wrap-up 5 min
Input
<ul style="list-style-type: none"> • Project progress reports • List of issues from project teams and list + charters of new projects • Outputs from rigor tests and agreed actions • Calendar for upcoming meetings • Communication plan
Output and Decisions
<ul style="list-style-type: none"> • Agree on next steps across projects, communication and meetings • Escalation of issues (if applicable)
Meeting rules
<ul style="list-style-type: none"> • Be on time • Come prepared • Secure your input to others • Mobiles muted • Be actively engaged • Raise any concerns or issues • Dedicate to decisions made

PMO Project Review Meeting
Purpose
To resolve any issues, overlaps or interfaces related to the PMO project portfolio. The PMO as a governance is to be addressed with all escalation issues on site project level. The progress of the projects get approved and corrective actions are assigned to any deviations from agreed plans. The project review will be made with every project leader individually.
Standard Agenda & Responsibilities
Review Participants 2 min
<ul style="list-style-type: none"> • Missing core participants have delegated responsibilities to other team members
Review exceptions to plans and key interdependencies 15 min
<ul style="list-style-type: none"> • Decide if any related action should be taken
Summarize decisions taken / to be made by SteerCo 5 min
<ul style="list-style-type: none"> • Resource conflicts and issues • Project delays and related impacts
Review action items from previous meeting 4 min
Potentially add new actions to action logger 2 min
Wrap-up 2 min
<ul style="list-style-type: none"> • Recap on actions to be taken • AOB (any other business)
Input

<ul style="list-style-type: none"> • Overview of the current status per project • List of exceptions per project • List of decisions needed • SteerCo action tracker
Output and Decisions
<ul style="list-style-type: none"> • Open decisions and issues resolved • Actions taken or dedicated • Progress approved
Meeting rules
<ul style="list-style-type: none"> • Be on time • Come prepared • Secure your input to others • Mobiles muted • Be actively engaged • Raise any concerns or issues • Dedicate to decisions made

Table 3. PMO Meeting Agenda Structure

Escalation Structure

Structure for escalation process for each project is individually defined. Complex studies should be managed as project and analytical projects must be steered very closely, especially

those which are cost intensive and should be well documented. The PM methodology for investment scenarios is implemented to all investment projects.

Figure 15 visualizes the PMO escalation structure:

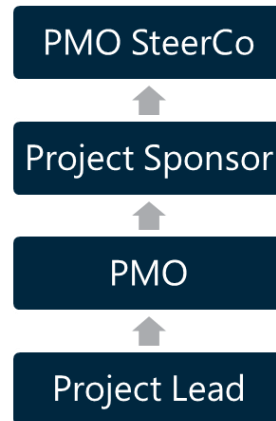


Figure 15. PMO Escalation Structure

Survey for collecting pain points

As a starting point the PMO team agreed to collect reliable data from PMO stakeholders and created the survey in April 2018. The purpose of the PMO planning survey (Appendix 1) was to identify the organization's current obstacles and potential pain points that the departments are facing. Additionally, to collect feedback through survey and set cornerstones for future improvement in the planning workshop.

The PMO SteerCo members were selected to define new targets for future PMO work. The actual data collection was the first stage. Target of the second stage was to form pre-defined targets and finally conclude new targets. Summary of top problems that case company organization faces:

- Poor forecasting and management of development project-based revenue
- Not enough resource capacity to perform more projects
- Lack of visibility into all of the development projects within the company
- Resource capacity and resource competence
- Sharing of info between departments (transparency)

- Visibility to other organizations' development projects might/will impact us
- There are no strategic KPI's available
- Program and project prioritization
- Lack of resources and lack of resource planning
- Slow and unclear decision-making process
- Timing and scheduling, schedule keeping of projects
- Resourcing of multiple simultaneous projects
- Ranking of proposed projects for pre-study phase

Piloting the PMO Quality Review

Piloting recognized to be valuable approach by PMO team, hence the PMO pilot decided to be started on April 2018. The aim for piloting was to orientate people to new governance model that the case company has not experienced before. Establishing new monthly reporting in parallel is another major improvement of the normal practices. Project quality review meetings will be continued normally after pilot ends, although the PMO concept would not be ready at same stage. The piloting started with three projects in the loop, all belongs to the case company's investment program. The schedule was the following:

- 9:00-9:30 Presentation from Project 1
- 9:30-9:40 Evaluation for Project 1 and Feedback
- 9:40-10:10 Presentation from Project 2
- 10:10-10:20 Evaluation for Project 2 and Feedback
- 10:20-10:50 Presentation from Project 3
- 10:50-11:00 Evaluation for Project 3 and Feedback

Project Manager and Business Process Lead were invited to the meeting to share the latest status of the project, sharing both point of views. The reporting cadence and status updates will be agreed on the first quality review. Default status will be handed out on a monthly

basis. Presentation takes maximum 30 minutes and after the presentation the project main evaluator has 10 minutes to collect feedback from other PMO core team representatives. Everyone in the PMO core team evaluates the project progress and gives scores accordingly.

Procurement Process

About purchasing organizations comment that the procurement process should be designed in a way that case company can order “by costs and not time driven”. There may be a following scenarios that can lead to time driven purchase:

- Investment program or project overall time schedule/deadline
- There can be only a few or one possible supplier for the requested material, equipment or process
- Supplier’s production capacity at the needed moment
- When is the right timing for investment project and development project schedule?
- Right timing for decisions (right timing and mature presentation to back up decision making)
- Special price package, which can be time driven
- If you buy two separate projects at the same time from the supplier

The case company experience about the project’s procurement process has been somehow straight forward and perhaps too easy? Tender packages have been gathered early in the pre-study phase together with the process owners, technical and procurement people and sent forward to potential suppliers and subcontractors.

Usually, maybe the case company have been lucky, in the pre-study phase and early in the concept phase it has been quite well known what is needed and scope is locked before the design delivery date. It can be that there has not been the schedule pressure behind and at the time of detail design, asked quotations has been fairly accurate. That have helped a lot when after the concept phase and final approval to invest has been granted. In parallel the case company started documenting statement of work and defining requirements specification. Usually they asked suppliers advice because they know it best. Is it the best

way of working? The relevance of proper design specification documents is also noticed to be highly valuable especially when analyzing and comparing supplier feedback, for instance.

Defining project objectives in early stages of the project, permission processes have been proceeding without any obstacles. All these have to be had in mind when doing the project study in the pre-study phase as there are effects in many places and usually by increasing the costs. Sometimes permits can take quite long, because of vacation times or because of the complexity of the process or project. The third party is not the specialist to understand the demand and the purpose. The case company have experienced this when they have worked with authorities.

Communications

The PMO should communicate its activities and achievements to internal stakeholders to maintain visibility (Alderton 2013, 02). Communication must be a puzzle for everyone to improve the success of project management. This personal observation has been supported by the PMI study, which found that 80% of projects meet original goals in organizations that are considered highly effective in the art of communication. Poor communication is a problem in itself, but it causes other problems (Cotgreave 2017.)

The newsletter of the case company provided information about our PMO. Basic principles of PMO introduced in the newsletter to define what PMO stands for and what it should do. The newsletter was established after PMO ramp up and continued on a monthly cycle.

External consultant supported the PMO lead in preparing first e-mail communications as per communications plan (Figure 16) what was created in concept phase. Ensuring the first PMO communication progresses accordingly to plan. Communication lead was assigned to support the process. Person nominated to prepare a detailed communications material for the upcoming communications.

Audience	Message	Media/Channel	Frequency	Timing	Responsibility	Goal
Steering committee	Summary of PMO QR's	Email	Every 1 month	Friday after site PMO steering committee meeting	PMO	Summarize QR decisions of the month
Development team or department heads and PMO coordinators	Summary of PMO QR's <u>excluding</u> only steering committee relevant information	Email	Every 1 month	Friday after site PMO steering committee meeting	PMO	Summarize QR decisions of the month. Further distribution in departments by department heads and PMO coordinators
Development teams	Quarterly newsletter <u>long version</u>	Email	Every 3 months	TBD	PMO	Inform development teams of current development projects and PMO's status
Whole company personnel	Quarterly newsletter <u>short version</u> (news post in intranet)	Intranet	Every 3 months	TBD	PMO	Inform development teams of current development projects and PMO's status

Figure 16. PMO communications plan

Communication was conducted at all three levels. The most effective communication channel is email in the case company. It can be used to distribute reports, information material updates and other messages. Major change updates are communicated in company intranet. Info screens are been used in communicating the important deadlines, happenings and development related topics. It can be useful to reach large number of employees who do not have access to email, for instance.

The communication of company-wide practices, processes, procedures and learned messages can be accomplished through a variety of methods, such as forums, webinars, e-mail notifications, training seminars or business communication tools (newsletters, webcasts, etc.) (Andrews 2014.)

Andrews is stating that project management performance tracking and measurements must be delivered by using project data maintained by dashboard reports or intranet sites. Management communication should be also made through a regular reporting cycle, either weekly, monthly or quarterly. It should contain non-recurring reports when the estimates of projects are deviating from the plan (Andrews 2014.)

The progress towards Implementation phase

A kick-off meeting with the top management was arranged to get a clear strategy where the PMO should focus in short term. The main focus of the meeting was to gather requirements from top management towards the PMO organization.

The following agenda was used in the top management kick off:

- Introduction: PMO progress and next steps of concept phase
- Current progress: Portfolio transparency towards strategy, after data collection
- Outline: That portfolio management is the service provider for top management to guarantee transparency for prioritization and decision making
- Questions and Answers: What are possible measures that need to be transparent to be able to control and decide on project portfolio?

One essential topic is to add project selection criteria to portfolio management practices which is also a new flavor for case company business. With project selection criteria, a case company can recognize relevant projects which supports the company strategy and also prioritize the most valuable projects and programs.

A portfolio evaluation tool was used for collecting and scoring various requirements that future PPM tool must contain. PMO team proposed a site workshop to align different site concepts and plan introduction material from PMO organization to line managers of the main department.

The required concept work to introduce Global PMO is mostly completed. Open items will be discussed with Site PMO development team. Next four quality reviews are scheduled, including projects with IT portion. High portion of operational program support, including ERP, Harmonization projects etc. is currently still very time consuming.

Once the local level is on expected level the PMO team started to prepopulate departments for each project in the current master project portfolio. Ensuring that current project portfolio data is completely aligned with company PPM needs.

The department PMO design work initiated with production department due to that they had the highest number of ongoing projects. At the same time the introduction was presented to Head of R&D from both company sites. The department PMO progress was reported to site management on a monthly basis.

The first steering group meeting was a success. It was great to see that the broader PMO structure is taking its final steps. It was agreed in the steering group review that the project portfolio refresh is postponed until August 2018, due to capacity issues. For the PMO, the

next steps will be to continue with the quality review piloting procedures and communication streams.

4.5 Implementation phase

This chapter describes the process that took place after the approval of the PMO implementation phase. The purpose of the implementation phase is to ensure that PMO structure is developed and main focus is on project portfolio tools creation and continue project quality reviews in parallel. During the implementation phase the PMO developed following tools and documents; project classification tool, strategic prioritization tool, stage-gate assessment tool, risk management tool and EVM tool. Additionally, the PMO develops unified project management templates for project lifecycle.

Tools and documentation

All companies with multiple projects at different stages of development are advised to take a systematic approach to carrying out project appraisal work. Providing an overview of the project appraisal nomenclature, concepts, techniques, and strategy for use by project appraisal and financial personnel (Bulick 1993.)

A systematic approach to project evaluation improves communication between the project team and corporate support functions. It also helps reducing controls and errors and provides feedback for future projects. Every company with multiple projects at different stages of development should use a systematic approach to carry out project appraisal work. This helps ensure that project teams carry out project appraisal work in a consistent and efficient manner (Bulick 1993.)

Project Classification

The purpose of project classification template is to understand complexity and risk-factors of new project candidate. It provides perspective on the content of the project or uniqueness and complexity of the process, timeline, stakeholders, changing environment, project team, budget and strategic importance and its economic benefits.

Table 4 describes the classification criteria and Figure 17 illustrates project classification template:

A	Demanding project
B	Typical project
C	Straight-forward project
D	Work package

Table 4. Project classification criteria's

Please put tick in the box if the statement is true

Criteria	Description and complexity statement				
		A	B	C	D
		Demanding	Typical	Straight-Forward	Work Package
The uniqueness and complexity of the project content or project process	The project will cause significant changes to existing processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	New work methods are used to implement the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project includes a number of subprojects, that are interdependent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project uses new technology or processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project develops tailor-made and unique solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project requires much integration into separate systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investment costs	Investment costs over € 100,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Investment costs € 20,000 - € 100,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Investment costs € 5,000 - € 20,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Investment costs less than € 5,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule	The project schedule does not have a buffer. Even a delay in a particular operation may delay the project and date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	The project is dependent on external factors that the project team can not easily manage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project can not be delayed. Even a small delay will cause major problems and losses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participants	The project uses subcontractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	The project involves people from several different organizational units (project crossing the departments' boundaries)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project requires special know-how that is not easy to acquire.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The success of the project requires close cooperation between previously unknown partners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Project participants work in several locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External factors and variables	External issues (eg Legislation, Standards) can change project goals or specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	The project is being implemented in a rapidly changing, precarious operating environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project is implemented in a complex or multilingual environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stakeholders	The project has several internal stakeholders that can affect the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	The project has (besides potential suppliers) several non-organizational stakeholders (eg Clients, Providers, and Partners) that can influence the implementation of the project or who use the results.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stakeholders' activism has a decisive impact on the success of the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strategic significance and economic benefits	The project has a broad impact on future activities / operating models.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	The success of the project greatly contributes to the organization's strategy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project is closely related to clients or other stakeholders, or the project is otherwise very important for stakeholder relations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project outputs have a large number of users (50 users or more).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project has a large volume of activity (eg a lot of incidents or a lot of events involved in the target process).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The project has the potential for significant economic benefits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Essential project - if the project fails, it will cause money or publicity loss or jeopardize the legitimacy of the company.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Classification of the initiative
D

Figure 17. Project Classification Template

Strategic Prioritization

In order to choose the projects to deliver, it is crucial that you have one prioritization system that allows do the ordering, sorting, and categorizing for different projects. Agyapong et al. say that it should focus on maximizing the business value, adjusted costs, customizable strategic targets of the company and the complexity of the projects (Agyapong et al. 2016.)

Agyapong et al. is stating that typically, project selection involves two types of restrictive resources, which are budget constraints and human resources. In general, the budget is a severe constraint that must be strictly adhered to; resource allocation may be a little more flexible, based on the different skill sets available (Agyapong et al. 2016.)

Agyapong emphasizes the importance of strict adherence to the portfolio management process i.e. using the budget most effectively and efficiently by selecting priority projects for the company's added value and not the most interesting projects (Agyapong et al. 2016.)

Figure 18 is the project prioritization tool:

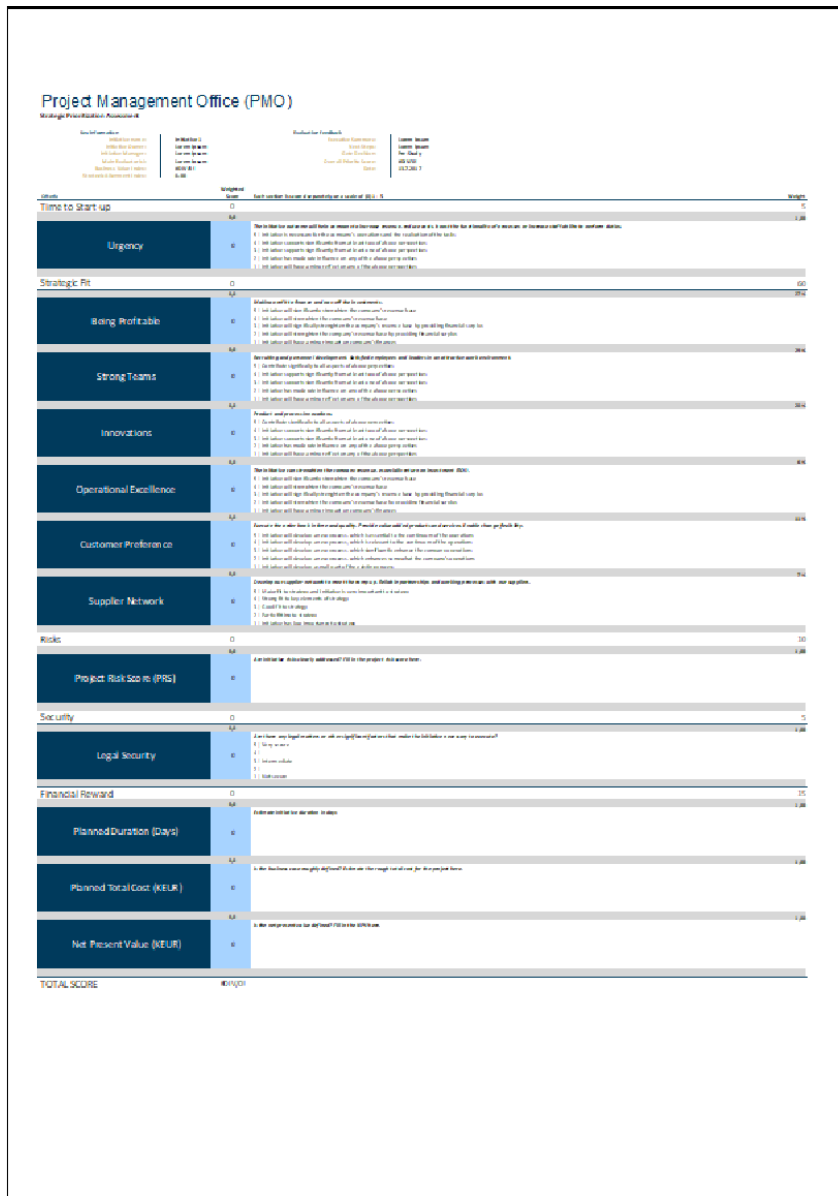


Figure 18. Strategic Prioritization tool

Stage-Gate Assessment tool

The stage-gate assessment tool was created to give leverage to project sponsors when they gazed at the progress of the project. Each criteria had its own specific weight and that could be adjusted to suit the situation. The evaluation itself was performed with integers 1-5 with designated criteria and weightage percentage for each gate.

Figure 19 is illustrating of stage-gate assessment tool:

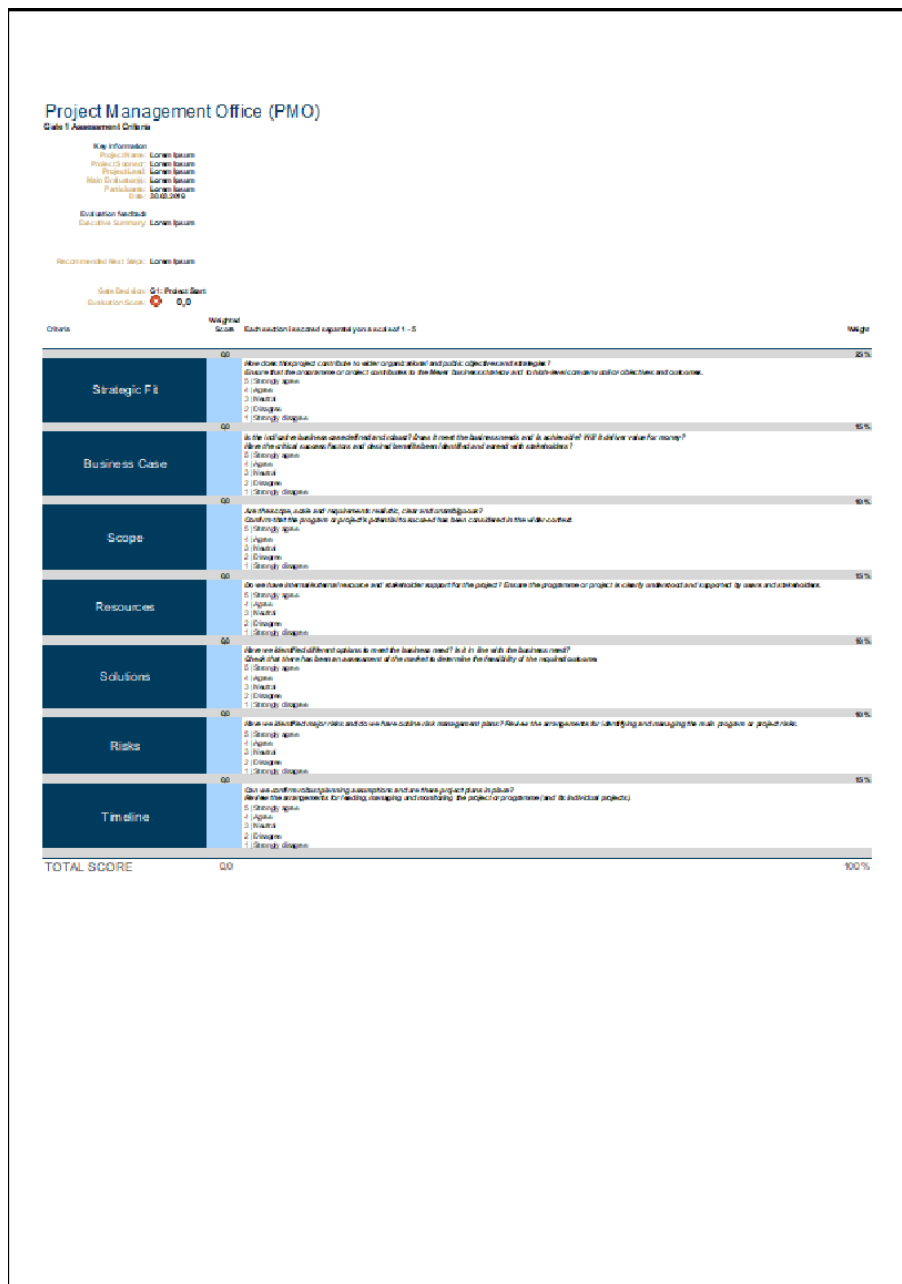


Figure 19. Stage-Gate Assessment tool

Following assessment criteria were defined throughout the project lifecycle:

Gate 1	Gate 2	Gate 3	Gate 4
Strategic Fit	Strategic Fit	Business Case	Business Case
Business Case	Business Case	Compliance	Contract
Scope	Solutions	Deployment Plan	Change Management
Resources	Procurement	Performance Indicators	Continuous Improvement
Solutions	Implementation Plan	Risks	Lessons Learned
Risks	Scope	Verification Plan	Future Plans
Timeline	Stakeholders	Readiness	
	Contract	Integration Plan	
		Contract	

Table 5. Assessment criteria created by PMO

Cost-Benefit Analysis

The cost-benefit calculation template was developed for a good reason. The creation of cost-benefit analysis was important step for each project in pre-study phase. However, maintaining the tool until the project closure was project manager's responsibility. The same tool provided approval template if new initiative needed to be approved by SteerCo.

Figure 20 illustrates the cost-benefit analysis tool:

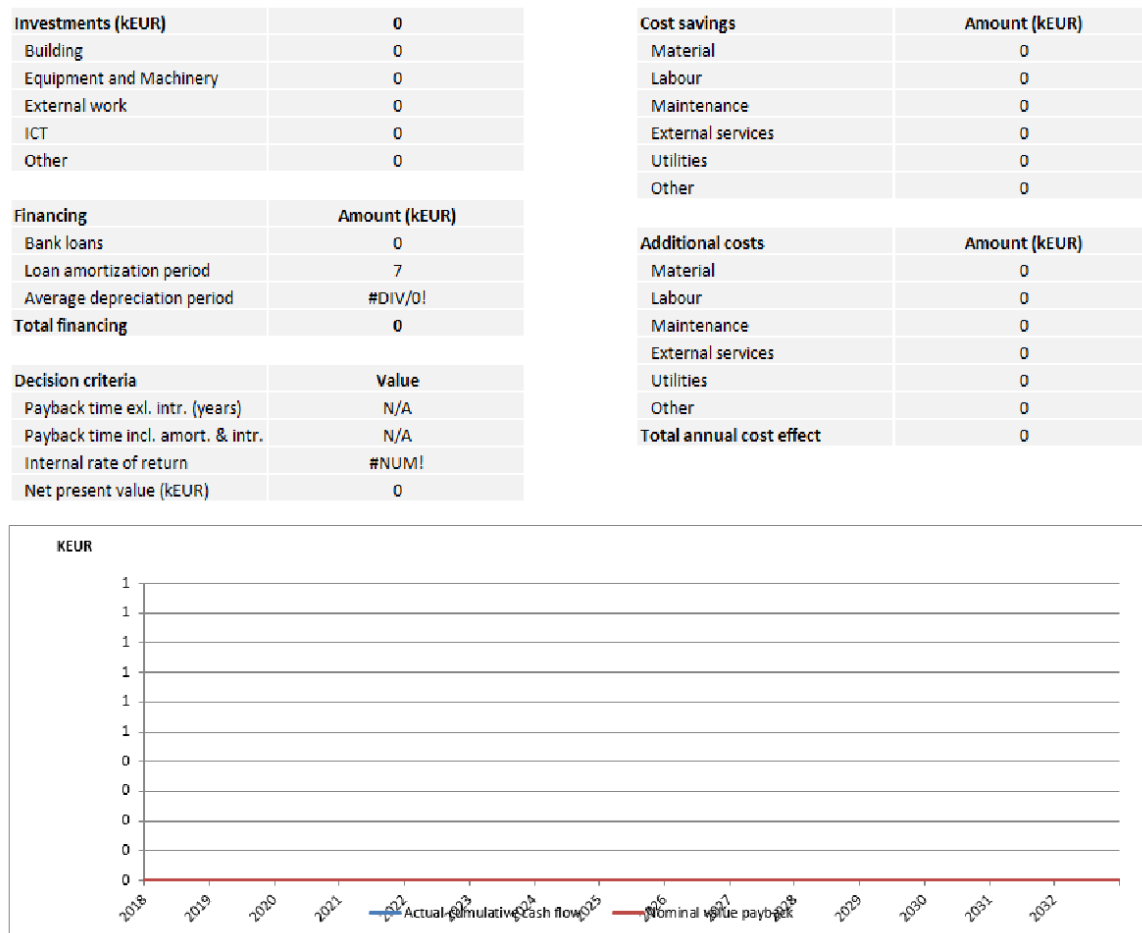


Figure 20. Cost-Benefit Analysis tool

Project Quality Review Template

A project quality review assessment identifies the signs of a project that fails in organization, dives into the root causes of problem items, and provides detailed feedback on how to get project back to the desired path. The quality review assessments have only positive effects on the organization. It resolves any issues, overlaps or interfaces related to the project portfolio. The progress of the projects gets reviewed and corrective actions are assigned to any deviations from agreed plans (Stanleigh 2018.)

The project review will be made with every project leader individually. Single project review lasts maximum 30 minutes, including project leads presentation towards the progress per reporting cycle. The PMO evaluates the project progress and sends the feedback to designated project stakeholders.

Project quality assessments not only reveal issues and challenges that can destroy the success of projects. It will also contribute to the experience gained, which may improve the success of new future projects. Project quality assessment is a useful tool for the company and pays back the money invested in the tool quickly. Leaders should be prepared to act on recommendations and demonstrate commitment and effort that projects will succeed (Stanleigh 2018.)

Figure 21 presents the PMO quality review template:

Category	Score	Weight	Weighted Score
Overall Status	1.0	10%	1.0
Documentation	1.0	10%	1.0
Schedule	1.0	10%	1.0
Cost	1.0	10%	1.0
Resources	1.0	10%	1.0
Risks	1.0	10%	1.0
Communication	1.0	10%	1.0
Targets	1.0	10%	1.0
Risks	1.0	10%	1.0
Procurement	1.0	10%	1.0
TOTAL SCORE	10.0	100%	10.0

Figure 21. Project Quality Review template

Risk Management Tool

Risk management tool was designed for project teams to catch possible risks that has been managed previously only in the project meetings with verbal style. It provides clear ranking for each risk item. It was important element when planning for example development project risks. Additional feature that PMO added was scoring capability for risk mitigation actions, security impact, cost impact and schedule impact. That feature helped project steering to understand potential risks more precisely but also helping project manager and project team to focus and manage the risks in new perspective.

Figure 22 presents the risk management tool:

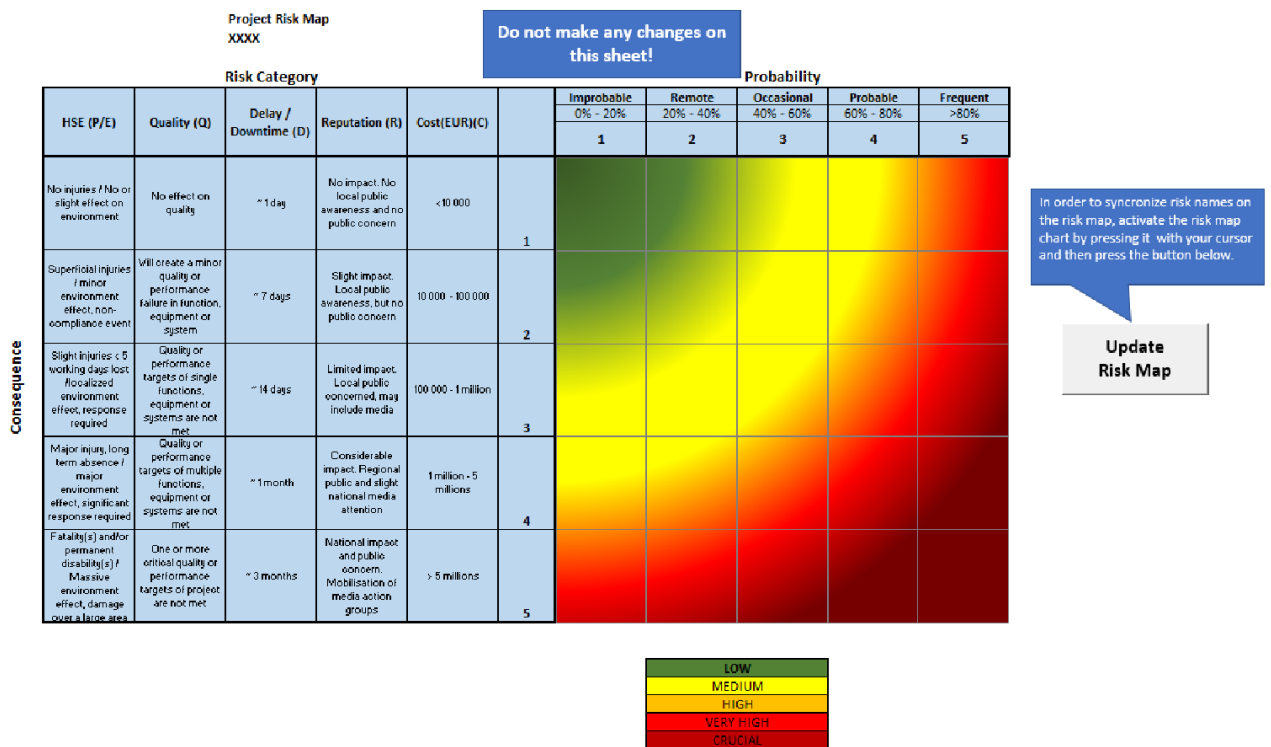


Figure 22. Risk Management Tool

Project, Program and Portfolio Reporting

Andrews states that the earned value management system (EVMS) provides the most widely used PM metrics and includes monthly, quarterly and yearly variation data. Based on Andrews, those metrics are cost performance index (CPI), schedule performance index (SPI), estimate at completion (EAC) and progress for single project or group of project

teams. Business unit or program and finally a summary that provides the full performance of each business unit and company (Andrews 2014.)

Ross & Shaltry adds that the portfolio reporting process collects performance indications and generates regular reports and evaluates the portfolio with regular measures. The audit of project sponsorship, accountability and ownership criteria must be aligned with the organizational standards. Ross & Shaltry emphasizes that it is important to review project priorities, dependencies, scope, expected return, risks and financial performance through portfolio evaluation criteria, organizational value and investment criteria.

Ross & Shaltry is stating that a company should consider the estimated impact of business forecasts, resource allocation, and capacity constraints on portfolio performance. It should be determined which projects will continue the progress, which will be deleted and selected into portfolio. Ross & Shaltry encourages to prioritize and implement the strategy with strategic objectives. Finally, they say that it is important to give recommendations to senior management or project level and when the change is encountered, the impact on portfolio will be calculated. (Ross & Shaltry 2006.)

Figure 23 presents the case company earned value management system:

Figure 23. Earned Value Management System

The case company EVM system was developed within the PMO team as there was clear vision that it would help to case company to identify project deviations before it is too late.

Figure 24 illustrates the key information PMO gathered for EVM analysis:

S#	Metric	Abbrev.	Description	Formula/Value
1	Budget at Completion	BAC	Baseline project cost	
2	Actual Cost	AC	Total costs incurred in completing work during a given period	
3	Earned Value	EV	Physical work completed during a given period	% Complete (work)*BAC (€)
4	Planned Value	PV	Physical work scheduled for completion during a given period	(TODAY()-Pre-Study Start)/Planned Duration*BAC (€)
5	Cost Variance	CV	Cost overrun during a given period	EV-AC
6	Cost Performance Index	CPI	Cost efficiency ratio	EV/AC
7	Schedule Variance	SV	Schedule slipped during a given period	EV-PV
8	Project Risk Score	PRS		
9	Schedule Performance Index	SPI	Schedule efficiency ratio	EV/PV
10	Estimate to Completion	ETC	Expected additional cost needed	EAC-AC
11	Estimate at Completion	EAC1	Expected total cost (CPI remains the same)	BAC/CPI
12	Estimate at Completion	EAC2	Expected total cost (If both CPI & SPI will influence the remaining work)	AC+{[(BAC-EV)/(CPI*SPI)]}
13	Variance at Completion	VAC	Estimated cost overrun at end of project	BAC-EAC
14	Time Estimate at Completion	TEAC1	A measure of the deficiency of the current state of the art is that in attempting to calculate the time estimate at completion	Planned Duration/SPI
15	Time Estimate at Completion	TEAC2	A measure of the deficiency of the current state of the art is that in attempting to calculate the time estimate at completion	(Today-Pre-Study Start)+(1-% Complete (work))*Planned Duration)
16	Average Index	n/a	Average of CPI and SPI	(CPI+SPI)/2
17	Planned, Earned, Actual	PEA	Planned, Earned & Actual along with Sparkline	
18	To complete performance index	TCPI	Calculate the work remaining divided by the funds remaining	(BAC-EV)/(BAC-AC) to complete on plan.
19	To complete performance index	TCPI	Calculate the work remaining divided by the funds remaining	(BAC-EV)/(EAC-AC) to complete the current EAC.

Figure 24. Key Information for Earned Value Calculation

Project Management Documentation

Project Description

Project Description was designed to idea phase. A project description is a preliminary sketch indicating why the project is being considered, what the project is about, and how it can be realized. Typically, it contains ideas on the project's scope, partners, expected benefits, and methods of execution, descriptions that provide a good starting point for more detailed planning. However, these descriptions offer an insufficient basis for project execution (Artto et al. 2011.)

The project description is a useful tool for communicating a project opportunity and initiating necessary project planning. Companies need a project description so they can make initial project decisions, including those relating to procurement. In drafting its project description, the customer often utilizes the competences of various stakeholders and their experiences on similar projects (Artto et al. 2011.)

Customer can use project description to communicate initial sourcing needs to potential suppliers. For the project supplier, the project description provides an opportunity to influence the project objectives and definitions and to consider whether or not the project is consistent with the company strategy and future. (Artto et al. 2011.)

Project Proposal

Often the project management or client needs a short project presentation document called a project proposal for everyday use to facilitate communication and decision making. The project proposal document is much shorter than the project plan but contains the same basic information about the project (Artto et al. 2011.)

It is mainly used for consulting and decision-making by senior management and project managers - for example, making key investment decisions and preliminary resource allocations and preparing the necessary calls for tenders (Artto et al. 2011.)

Project Plan

A project plan is a key tool in project management; it helps maintain project work and project management as a balanced entity, ensuring that their content is correct. It involves discussion of technical implementation, but only at a general level sufficient to define and manage project work; and includes project content, goals, work, procedures, and leadership principles. Technical solutions, work procedures and work standards and methods can be presented in more detail in separate plans and guidelines and utilized where appropriate (Artto et al. 2011.)

Responsibility for the implementation of the project plan rests with the project management, but all parties involved in the work utilize this plan. The project plan will be specified as the project progresses. The project plan should be approved by the project decision-maker, often the project owner or the steering committee (Artto et al. 2011.)

Changes to the project plan can be made if, for example, the customer's need, resources, strategy or operating environment change. The potential need for change motivates the project initiator to write a project plan at a sufficiently detailed level so that every small change in circumstances does not require a plan change. If any changes are made to the plan, the updated version must be submitted to the appropriate decision maker for approval (Artto et al. 2011.)

Project Final Report

This is a Project Leads report for the project sponsor and describes how well the project has been successful against the project proposal and project plan, including the initial planned costs, schedule and expected benefits (which can be estimated at this time). Final reporting

is usually tied to project closure; project results will not be accepted until the final report has been completed and approved. At this point, all project documentation must be up to date (Artto et al. 2011.)

Change Request

Changes in the scope of a project always effects of other project objectives. Therefore, change management should take place in a methodological and controlled manner. Change management practices can be agreed as part of a project plan, project norms, or other project guidelines. Typically, change management goes from identifying the need for change to analyzing the change and accepting (or rejecting) the change (Artto et al. 2011.)

Identified change needs are addressed in the project through a request for change. In order to systematically process changes, requests for changes must generally be made in a consistent manner and in accordance with an agreed process. Once the change request has been identified, saved and approved, the project plan should be adjusted to reflect the change. The change shall be notified to the interested parties (Artto et al. 2011.)

Change management involves risk management in many ways. Change management becomes relevant if anticipated or unforeseen risks materialize or if other deviations from the plan occur. Risk management can be used to reduce the need for change management, but changes cannot be completely avoided (Artto et al. 2011.)

Status Report

Reporting is an essential part of project management. Without proper monitoring and reporting, project management would remain random and vague and likely to fail. Consistent reporting is needed to understand the status of the project, to provide a solid basis for decision-making and to justify actions based on facts, not just emotions (Artto et al. 2011.)

Reporting may require the collection and processing of both descriptive and quantitative data. Numerical information is often available from vendor systems for material management, resource management, scheduling, and accounting (Artto et al. 2011.)

Project-specific reporting may be possible based on project accounting codes in company reporting systems, although project resource and cost management has not been developed to this level in all project vendor organizations. All project partners have qualitative, descriptive information (Artto et al. 2011.)

4.6 Closing phase

This chapter describes the process that took place after the approval of the PMO closing phase. The purpose of the closing phase is to ensure that PMO governance structure is working and tools are working as expected. Additionally, to ensure the PMO future development plan and training plan are created. Finally, to collect feedback from PMO stakeholders to net promoter score-analysis.

PMO Development Plan

PMO development roadmap was set up to give direction to which PMO's development was to come in the future. Another useful point was to make the PMO development visible so that both the steering group and the network of stakeholders knowing that all the time what the future development trend is coming by.

Figure 25 describes the PMO development roadmap:



Figure 25. PMO Development Roadmap

Company management has stated that “Sub-marine” projects should be avoided as much as possible. Projects related to those topics that are not addressed yet and are urgently needed to be set up. Ensuring that the projects are executed well. The PM method is used in the projects on global, site and department levels and all projects will be quality reviewed, in order to get deeper understanding about the progress. Phase release recommendation for each project should be executed based on the positive feedback. Clear definition of project targets,

KPI's, project deliverables, project organization, timeline, scope are ensured and challenged, in case they do not meet the standard structure.

Training Plan

External consultant suggested combining input sessions with support sessions for following reasons. The input sessions will provide the people with the necessary basic knowledge about project management method, including purpose and intended benefit, principles of application, technical terms, and general procedure. The availability of some crucial background information is important for getting a basic understanding of PM method, the underlying logic as well as the practical value associated with it.

The other point external consultant proposed selecting the participants for the trainings deliberately for following reasons: The people will only benefit from a method-oriented training when they have the opportunity to directly put their newly gained knowledge into practice. Not all of the people currently involved in projects need to have an elementary PM method knowledge at this stage of the process. First and foremost, it is the project leaders who need to know now what PM method is about and how to apply it to their projects. It is up to them firstly, to structure and organize the initiatives accordingly, and secondly, to involve and lead their project sponsors, team members, and stakeholders accordingly.

It was strongly recommended initiating the whole process with a start workshop, for following reasons: In order to act as central office we need to align our understanding of PM method, the extent projects should stick to PM method at this stage of the process, and the way PMO, compliance bodies, like controlling, quality management and information security management, and projects should co-operate. To provide for a fruitful training approach we should sufficiently clarify both the business expectations as well as the specific goals, requirements, and contents for the trainings beforehand.

Mission Alignment

Initiation with PMO stakeholders with 1 day at case company to meeting. Meeting should contain introduction to PM method for participants and clarification of expectations and needs of the members. Clarification of training and support goals, requirements, meeting contents, and target audience will be collected beforehand.

Training plan

Execution of input session (Part I) and support sessions (Part II), starting with 3 runs, 3 days per run at case company, Day 1 gives an introduction to PM method for selected project teams and practical support for selected project teams (Day 2 and 3).

Review with PMO

4 hours as part of 3rd run at case company. Session would ultimately form an evaluation of training, support effects and planning of next steps.

PM method on-site days at Turku
Part I:
Input Sessions: Introduction to PM method 4-hour session with seminar style. Possible contents of the meeting are explaining the business needs behind PM method and the basic principles of using PM method and also explaining the way from a project idea to the approved project start. Explaining the further execution of a project concept to project implementation
Part II:
Project-specific support sessions from 2 to 4 hours per session with workshop and team coaching style. Possible contents of the meeting are supporting project teams to apply PM method on their projects. Answering their questions with regard to the application of PM method. But also, on demand requirement such as working with the project participants on the use of helpful project management methods and techniques. Detailed PM method support for Key Users.
Agenda Alignment
<ul style="list-style-type: none"> • Introduction to PM Method and Clarification of Training • Goals and Requirements; Definition of Target Audience, 1 day • Review Workshop: Training Evaluation and Planning of next Steps • Appointment on-site at case company (1/2 day, integrated in 3rd run) • Trainers: External

Training Part I - Input Session
<ul style="list-style-type: none"> • Introduction to PM method • Principles and Benefits of PM method • On-site case company; 2 trainers; 1/2 day per run; 3 runs • Max. 20 participants (selected audience) • Trainers: External
Training Part II - Project-specific Support Sessions
<ul style="list-style-type: none"> • Workshop with selected Project Teams; 2 parallel streams; each • Workshop lasts 2 to 4 hours; small groups (max. 5 participants) • on-site case company; 2 trainers; 1 1/2 day per run; 3 runs • Trainers: External

Table 6. PMO training plan

Net Promoter Score

Net promoter score (NPS) was one key tool that the PMO started to use effectively after implementation phase. The PMO collects the feedback (Appendix 2) and analyses the data from the customers by using Net Promoter Score in yearly cycle.

Following Figure 26 illustrates the user feedback indicated by PMO stakeholders:

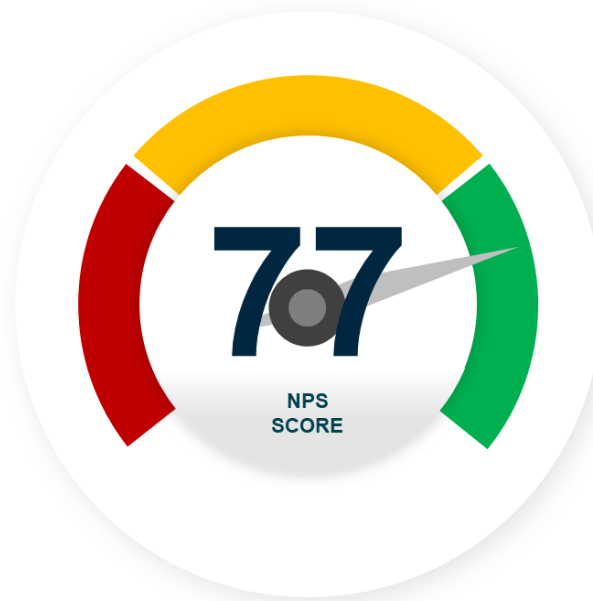


Figure 26. PMO Net Promoter Score

The case company PMO is often seeking better ways to serve its stakeholders. The first ever stakeholder satisfaction survey indicated 77% NPS at April 2018 and purpose is to continue annually collecting the feedback. 25 internal project leads were participating on the survey. 0% were detractors, 23% were passives and 77% were promoting the work that the PMO has made during the first two years.

5 Discussion

The role of the case company PMO was to implement the company's strategy by creating working PMO concept. Monitor project performance and execution progress. Create and maintain the PPM tools and templates. Provide PMO training support and collect feedback. Active portfolio management at all different levels, including case company development portfolio monitor and control process. Create and maintain timely portfolio snapshots and create Steering Group policies and structures. Own the PMO concept model maintenance and development.

Properly managed project portfolio is one of the most important factors for successful strategy implementation. However, as this technology is highly dependent on stakeholder support and purchase activities in PPM process it is important that PMO is not only skilled in project management and portfolio management standards. It must also have the necessary

management support and soft skills, including leadership, stakeholder management and commitment (Agyapong et al. 2016.)

There has had been a deep dive talk with company leaders about all the strategic projects and activities to understand if quality review is needed when company has EVM reporting now and to better understand current issues around the IT interfaces and tool development requirements.

The company leaders outlined strong dependencies between the technical investments and the IT application, system landscape and implementation process. For example, how and what kind of product data management content will be needed and transferred to machine level or how the processes will be integrated in the enterprise resource planning environment. There have been pre-discussions and presentations with PMO leads and others, but an official and structured approach is missing to tackle this.

The development requires support of the PMO, to set up a project called “Integration of investment projects in strategic IT landscape”. The initiative is currently within the idea phase to build the momentum for a project environment with clear planning of work packages, responsibilities etc. The PMO, project sponsor and key stakeholders should get this started, to clarify the further contacts and upcoming steps.

All this to ensure that the investments will be effectively integrated in the modernization of the IT landscape and to catch the experiences from company departments which has the required expertise.

6 Conclusion

Based on personal interviews, internal surveys and group discussions with different stakeholders from case company line organizations, there was a strong requirement for the PMO. As stated earlier in this research, the important aspect is to continue building high quality products. At the same time implementing new investments, which will help the case company to manufacture better products in the future.

New investments require process changes and new ways of working, hence that was one reasons this PMO implemented to support a multi-project environment. The first impression was that the demand was not even recognized in the changed management process. Even

though some details were known, the challenge was to set the targets on a reasonable and realistic level.

The degree of using internal resources for development project work was rapidly increasing at all departments. It was in fact a major problem when personnel were expected to support, not only product manufacturing but also development project management. The need for project management training was also heavily increasing. People did not have experience of project management process and organizations' governance models were not supporting that either.

Created PPM tools was praised, and leaders were very pleased about how it creates visibility on the execution planning. Essential part of project categorization process is project selection criteria. Generally, the PPM tools has been created but its development will continue along the process.

The PMO has officially been performing now approximately two years and the work hopefully continues in the future at a continuous improvement mode. Evident benefits have been realized when scheduling project level meetings and portfolio level steering meetings. Stakeholder's feedback has been very promising from the beginning.

6.1 Evaluation of Results

The thesis was action research and several service design methods were used during the research. Action research worked out well in case company PMO concept work. There was lot of testing, piloting and iterations rounds, which improved the PMO concept maturity on the fly. The research questions were following:

1. How does the PMO concept support the process? The multifunctional PMO team formed a unified and comprehensive service that provided the following services; support in defining objectives and scope, support in planning of milestones, work packages and resources, project "health check", PM method support and structure, change communication, issue escalation/problem solving, resource tracking and facilitation support for workshops.
2. What are the key components that create the PMO concept? Based on simplified PM method, selected PPM components were following; project classification template, strategic prioritization tool, stage-gate assessment tool, cost-benefit analysis, project quality review

template, risk management tool and earned value management tool. The key components were designed to support PMO services at each PM phase and stage-gate.

3. How does the PMO concept works? Based on the latest feedback received from the PMO stakeholders (described in chapter 4.6) net promoter score indicated 77% success rate, hence it can be seen that the PMO concept work have been in the right track from the beginning.

The progress has been completely in line with the designed PMO concept. However, guidelines and structure have to be kept as simple as possible and still include all the important issues related to project portfolio management. All of the end users are not so trained PM professionals. PMO guidelines has grown quite a lot, which is totally understandable. There are many different kinds of projects where all the parts of the PM method are not applicable and that can be confusing sometimes. Hopefully the case company starts to train internal PM professionals before assigning them to lead the projects.

Something that has been discussed with the PMO team and external consultants. Is it necessary to raise approval level between implementation and deployment phase to global PMO level? PMO team did not see the need for that. There should been check point by local PMO that agreed guidelines have been followed and the required documents have been collected.

Agyapong et al. say that creating portfolios alone does not save the company. In authors opinion, it is important that portfolios will be continuously monitored by using objective metrics like progress, scope, targets and project benefit. The availability of this objective information is essential to determine which portfolio is performing well or not (Agyapong et al. 2016.)

After PMO

The planned processes during the thesis were implemented in different phases. First, the evaluation of individual projects was started. Then a PMO governance model and reporting cycles were created. Creation of the Stage-Gate model was a more challenging task, but it was also achieved through effective collaboration. Soon after that, the earned value reporting structure was created and the principles of resource management to support it.

Figure 26 shows some of the key processes created by the PMO:

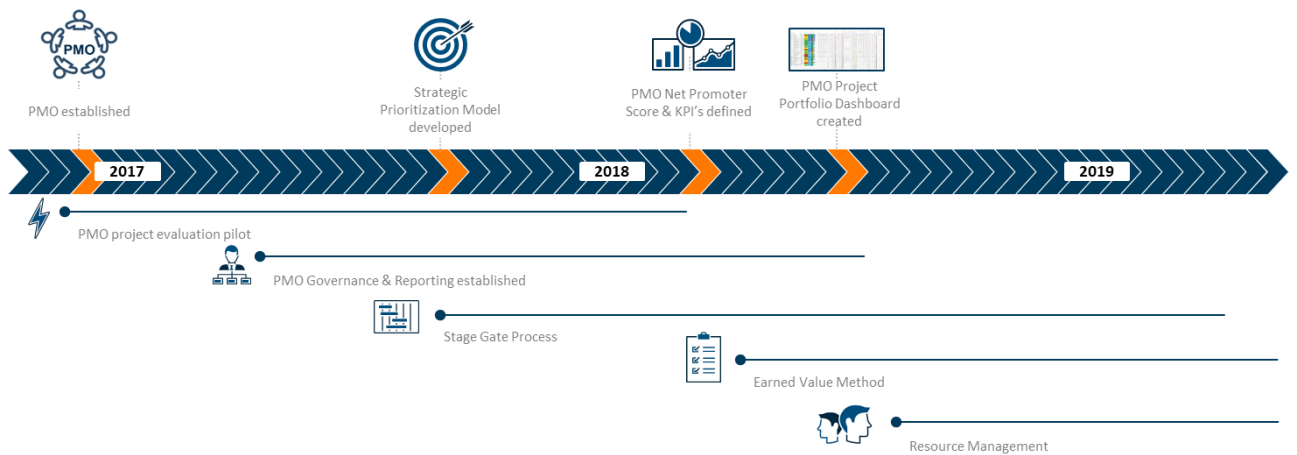


Figure 27. After PMO introduction

The feedback of practical difficulties people experienced in their projects so far, are collected with interviews, surveys and co-design workshops. Getting the correct EVM data values for the simulation of the project progress is currently very time consuming. Project management methodology guidelines and trainings are essential to continue to support. Process owner must familiarize with new project managers to the PM method process which documents are required and which is going to be updated.

The case company SteerCo have decided that there is one PMO team only. The members are from all company sites. Hence, the PMO have the full project portfolio view on its radar. It is important to see possible project collisions, to decide on the cancellation and project archiving, due to project bottlenecks, business importance or architectural reasons. The case company need to understand the project interdependencies more precisely as they find synergies when new projects arise. Communicating PMO value should be started; only within reports and with concrete delivered values and show case that PMO has helped, not that PMO will help.

6.2 Prospects of Future Development

Lately, the PMO had intensive discussions with the corporate management about their priorities when thinking of PMO in the future. Leaders are expecting the PMO to focus on operations and to deliver the expected value from created PMO structures. In terms of project/program support, the PMO should focus on project management methodology development and applying the PM method principles to every projects and future programs.

The future main priorities were defined by the company management team and they wanted regular updates on the project portfolio. The PMO should prepare on demand reports after SteerCo to all management members, focusing on portfolio progress, changes happened in portfolio, already made decisions and upcoming decisions to be made. All these actions should increase the knowledge of what is ongoing in the company sites. The management team members are informed and should say in the future that they are always on top of the situation.

The PMO should continue to work on the right projects (PPM) and ensure that all projects on each level are properly identified. Aiming 100 % transparency on global and site portfolios, in terms of quality, scope, costs, timeline, resources, impact, issues, and decision schedule. As many projects as possible should be evaluated if they make sense. Choosing all necessary projects and allocate key resources to those projects that matter the most.

A transparent decision-making template is required for portfolio decisions, which allows comparisons between the projects and possible prioritization. Interdependencies and competition in terms of resources are known. Categorization and members of project SteerCo for each individual project has to be clarified. Basic data information and PM guide should be accessible for all projects. Value tracking process need to be in place to ensure that projects deliver the promised benefits and estimated values.

This is what the PMO needs to deliver still, in order to win the stakeholders' trust. This means more live operations of PMO instead of design and concept work. Less discussions and meetings internally, more with projects. The PMO team has delivered enough tools, templates and supported the design process well enough, hence the PMO should focus on execution and continuous improvement from now on. There is a strong believe that this is useful for the planning of the future work and PMO team is glad that case company has much better clarity on that now.

The PMO team would like to emphasize that the PPM tool should still be investigated as there are already available "of the shelf" solution in the market. Based on Cottino, the PPM tool creates added value for an individual company. It serves as a repository for projects that are categorized according to the company's project management method. It creates visibility for executives, resource managers, and project managers. These types of tools will facilitate decision-making with prioritization algorithms, considering costs, risks and resources. In

addition, the tool ensures an efficient portfolio analysis, allowing the organization to get the best benefit from its expenditure (Cottino 2015.)

There are many obvious benefits in the case company that the PPM tool makes the project managers life much easier. It can be customized to fit the case company's PM methodology structure, approval phases and gate decisions. Naming below few great benefits:

- Transparency
- On demand reporting
- No need to build up and gather information from the separate systems
- All the project information is gathered step by step in the system
- Presentation can be gathered easily with the up-to-date information.
- Documents in the system/links for example to company document repository
- Speed up the decision making
- Stage-gate decisions can be directed to the right people from the tool. All the needed information in the system to support the decision.
- Governance log
- The needed tools are in the system
- Business case management & risk management

At this stage of the PMO implementation, there should not be many kinds of templates to fill up. All the information is in the system and the case company can create different reports with that data.

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Appendices

Appendix 1. PMO planning survey for Top Management

1. General

Most important controlling element for the PMO is?

2. Problems to be solved:

Top three problems that your organization faces?

- a. 1.
- b. 2.
- c. 3.

3. Vision

The vision of the PMO is to:

4. Mission

The mission of the PMO is to:

5. Goals and Objectives

The goals and measurable objectives of the PMO are?

Goals

- a. 1...
- b. 2...
- c. 3...

Objectives (how much and by when)

- d. 1...
- e. 2...

- f. 3...

6. Reporting

Content of the PMO Project Portfolio Report:

How would you rate the quality of our PMO reporting? Please choose one.

- a. Very high quality
- b. High quality
- c. Neither high nor low quality
- d. Low quality
- e. Very low quality

Select following options you want to include PMO reporting? Please select all that apply.

- f. Global Project Portfolio
 - g. Site Project Portfolio
 - h. Department Project Portfolio
7. Performance

Overall, how satisfied or dissatisfied are you with our PMO? Please choose one.

- a. 5 - Very satisfied
 - b. 4 - Somewhat satisfied
 - c. 3 - Neither satisfied nor dissatisfied
 - d. 2 - Somewhat dissatisfied
 - e. 1 - Very dissatisfied
8. Feedback

Other specific feedback or improvement ideas to the PMO:

Appendix 2. PMO Survey

1. My role is?
 - a. Project Sponsor
 - b. Process Owner
 - c. Project Lead
 - d. Project Engineer

2. What is your project experience?
 - a. I am experienced project lead and have introduced demanding projects previously.
 - b. I've have led typical projects in my previous life
 - c. Project lead role is rather new to me. I have led straight-forward projects.
 - d. I have no project lead experience, but I have supported the project execution.

3. My organization has PMO process?
 - a. Yes
 - b. No

4. We use a project management methodology (PM method) for project execution?
 - a. Yes
 - b. No

5. What project knowledge management area is most challenging from your angle at the moment? Select all that apply.
 - a. Project time management
 - b. Project cost management
 - c. Project scope management

- d. Project risk management
 - e. Project resource management
 - f. Project communication management
 - g. Project stakeholder management
 - h. Project procurement management
 - i. Project integration management
 - j. Project quality management
 - k. Other:
6. In what area has PMO supported your project the most? Select all that apply.
- a. PMO provided new tools and templates for project execution
 - b. Project issues were presented to senior management with the help of the PMO
 - c. PMO helped to identify key resources to support the project execution
 - d. Site wide project portfolio visibility has increased after PMO implementation
 - e. PMO gave useful contacts within the company
 - f. Other:
7. What kind of service should the PMO offer in the future? Select all that apply.
- a. Project management method for initiation to project completion
 - b. Project management tools and templates
 - c. Project management process clarity in the company (who to contact and when)
 - d. More transparency to development projects
 - e. Consistent PMO communication
 - f. Project management trainings

- g. IT enabled project management database and system
 - h. PMO should organize a department PMO coordinator to each main department
 - i. Unifying the project management processes in the company
 - j. Other:
8. In what way would you like to be informed or educated? Select all that apply.
- a. Clear contact persons to PMO or department PMO
 - b. Intranet, emails and newsletters
 - c. PMO SharePoint material or other online document storage
 - d. Project management courses, workshops or training days
 - e. PMO fair at Case company site
 - f. Other:
9. Overall, how satisfied or dissatisfied are you with our PMO service? Please choose one.
- a. 5 - Very satisfied
 - b. 4 - Somewhat satisfied
 - c. 3 - Neither satisfied nor dissatisfied
 - d. 2 - Somewhat dissatisfied
 - e. 1 - Very dissatisfied
10. Which of the following words would you use to describe our PMO services? Select all that apply.
- a. Reliable
 - b. High quality
 - c. Useful
 - d. Unique

- e. Good value for money
- f. Underrated
- g. Overrated
- h. Impractical
- i. Ineffective
- j. Poor quality
- k. Unreliable
- l. How would you rate the quality of our PMO services? Please choose one.
- m. Very high quality
- n. High quality
- o. Neither high nor low quality
- p. Low quality
- q. Very low quality

11. How would you rate the value for money of current PMO services? Please choose one.

- a. Excellent
- b. Above Average
- c. Average
- d. Below average
- e. Poor

12. How responsive have we been to your questions or concerns about development project management? Please choose one.

- a. Extremely responsive
- b. Very responsive

- c. Moderately responsive
- d. Not so responsive
- e. Not at all responsive
- f. Not applicable

13. How long have you been a customer of PMO? Please choose one.

- a. Less than six months
- b. Six months to a year
- c. Over 1 year

14. How likely are you to use any of PMO services again? Please choose one.

- a. Extremely likely
- b. Very likely
- c. Somewhat likely
- d. Not so likely
- e. Not at all likely

15. Where do you work currently?

- a. Case company location
- b. Case company subsidiaries
- c. Subcontractor

16. Other specific feedback or improvement ideas to the PMO: