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Project Management Office (PMO): Typologies and Models

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Dissertation for the degree of Master of Information Management with specialization in Information Systems and Technologies Management

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Instituto Superior de Estatística e Gestão de Informação
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by

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ABSTRACT

Organizations are facing competitive and globalized markets, as well as constant environmental changes that often require an organizational restructuring of the business models in order to boost performance. Project management practices can help to achieve strategic goals and increase value of projects in organizations. The Project Management Office (PMO) is an organizational structure created in order to promote and improve project management practice, by adopting appropriate methodologies to achieve high levels of efficiency and effectiveness.

In recent years several models and functions of PMO have been proposed by many authors, varying from the PMO with a sole function of reporting project execution, to the one who participates in the definition of organizational strategies. The main purpose of this article is to present a review of the typologies of PMO and their main functions. Since the importance of PMO is increasing in organizations, the results of this work are useful to provide guidance to organizations on implementing or restructuring their own PMO.

KEY WORDS

Project Management Office; Project Management; PMO Models; PMO Type; PMO Typology; PMO Functions, PMO Authority.

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CONTENTS

FIGURE INDEX

TABLE INDEX

ACRONYMS AND ABBREVIATIONS

EPMO	Enterprise Project Management Office
ICT	Information and Communications Technology
IT	Information Technologies
PM	Project Management
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMO	Project Management Office
PMoCE	Project Management of Center of Excellence
PO	Project Office
PPM	Project Management Portfolio
TP1	Typology Englund, Graham & PC Dinsmore, (2003)
TP2	Typology Kendall & Rollins, (2003)
TP3	Typology Garfein, (2005)
TP4	Typology Letavec, (2006)
TP5	Typology Desouza & Evaristo, (2006)
TP7	Typology Gartner - Fitzgerald (2008)
TP8	Typology Hill, (2008)
TP9	Typology Kerzner H. (2009)
TP10	Typology Crawford, (2011)
TP11	Typology PMI (2013)
TP12	Typology Bolles & Hubbard, (2015)

1 INTRODUCTION

Organizations are increasingly under pressure from the external environment, requiring constant innovation in its products and services. To meet the needs of customers and other stakeholders, organizations develop various strategic and operational projects, whether for competitive advantage either by legal requirements or other.

As the number and complexity of projects in the business world has increased, the need for centralized project coordination functions has also grown. Good project governance for project management comprises the value system, responsibilities, processes, and policies that allow projects to achieve organizational objectives in the highest interests of all the stakeholders, internal and external, and the corporation itself (Müller, 2009).

Despite the evolution of project management in recent decades there are still frequent failures in the execution of projects, which lead to results that hinder the business.

There are many reasons that affect the expected performance of a project as, for example, bad decisions, lack of project management knowledge, and lack of consistency in the methods used, among others.

On the other hand, it is not uncommon that projects are assumed as mainly technical-oriented initiatives, with a strong focus in the scope, cost and time, but ignoring other key areas such as quality, risk, human resources, communication or management contracts, thereby jeopardizing the project success potential.

To remain competitive, today's organizations adopt project management, defined as the application of knowledge, skills, tools, and techniques to meet the requirements and objectives of the projects by implementing appropriate processes and methodologies (PMI, 2013), as part of their strategy and as a critical factor in the development of competitive advantages (Kerzner, 2009).

The Project Management Office has become a widespread and well-known organizational phenomenon, mainly in large organizations. However, in many large organizations, the PMO is being implemented without a clear image of what it might entail.

There are several typologies of PMOs in the literature (Unger, Gemünden & Aubry, 2012), which makes difficult to identify the models and functions that are useful

to implement in organizations. The aim of this thesis is to investigate and analyze, based on the literature review, which are the models and functions existing in the typologies of PMO that are proposed by researchers and the practitioners.

1.1 Research Background

Many organizations implement projects that are not managed according to a formal project management methodology and instead apply *ad-hoc* processes. The result is the achievement of weak outcomes. Establishing an effective and efficient practice of project management continues to be a challenge for organizations. Without a good definition of the processes will be difficult or even impossible to achieve the expected project goals.

Seeking to solve this problem, in recent years new structures have emerged in some organizations, such as the Project Management Office, in order to improve project management and avoid wasting resources.

A Project Management Office is "an organizational body or entity who are assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. The responsibilities of the PMO can range from providing project management support functions, to actually being responsible for the direct management of a project" (PMI, 2008).

It is a structure formed by the organization in order to promote and improve project management through the adoption of appropriate methodologies to minimize risks, conflicts and achieve satisfactory levels of efficiency and effectiveness in project management. This structure has been associated with obtaining better success rates in project management, understanding success as delivering projects on time, scope and budget (PMI, 2013).

According to Kerzner (2009), PMOs have been improved as part of an organizational structure in our modern enterprises and "could be the most important project management activity in this decade". In fact, one of the research topics, which are gaining more and more momentum in the area of project management, is Project Management Office (Aubry, Hobbs, Muller & Blomquist, 2010).

Due to the importance of PMO in project management and strategic alignment with business, many models have been built around the typology and functions of PMOs.

1.2 Problem Statement

For many organizations defining the PMO role is a struggle, along with its position for long-term-success and the way for it to leverage the PMO support achievement of the organization's strategic objectives (PMI, 2013). With the growth of project management environments, multi-project or strategic PMOs have emerged to develop competence in project management, manage single project performance, and coordinate multiple projects (Unger, Gemünden & Aubry, 2012).

The survey conducted in 2007 by Hobbs and Aubry of 500 PMOs found considerable diversity and lack of consensus regarding the roles and terms that should be included in the structure of a PMO (Hobbs & Aubry, 2007).

Aubry, Hobbs e Thuillier (2007) consider that the research in project management has, frequently, presented difficulties regarding the understanding of how the PMOs should be managed in companies, which do not work exclusively with projects. According the authors the PMOs are structures which connect multiple dimensions of an organization and, as such, shall not be evaluated only regarding deadlines, costs, time and performance but also regarding the cohesion of the teams and the strategic alignment of the projects.

It is predicted that the PMO area will have a significant increase of importance in organizations, particularly in terms of ICT as a means of enabling more effective management of the new requirements that will emerge in the orientation of IT Departments resulting from the constant evolution of ICT, and the need to equip the internal IT resources with a higher organizational skills in the practice of project management. The implementation of PMO strategies can be a promising way. PMO is associated with the increasing number and complexity of projects and the need of gaining competences (Aubry, Hobbs & Thuillier, 2007).

1.3 Research Questions

According to Yin (2003), defining the research question(s) is one of the most important steps in the research projects. In fact, the research questions determine the research objectives, the research design, and also data collection methods (Yin, 2009). In this research the following questions have been defined:

RQ1 - What models of PMO are currently proposed by the researchers and practitioners?
RQ2 - What are the main functions of a PMO?
RQ3 - What are the functions that each model includes?

The main aim of the study is to contribute to a better characterization of PMOs, identifying the Typologies and Models of PMO, their roles and functions.

The results provide guidance to organizations that are currently considering implementing a PMO, or redesigning an existing one, may here find information leading to a better definition of the PMO models to adopt in their organization. Provide also a basis for further research.

1.4 Dissertation Structure

This document begins with a discussion of the importance of project management for organizations, in obtaining the best delivery of products or services and to gain competitive advantage.

It also states the research problem and the research questions. Section two explains the concepts of PMO proposed by various researchers. The methodology used for identifying PMO models and further analysis and description of these is presented in section three. Section four addresses what is meant by a PMO model, and we then introduce the various PMO Models that were found in literature. In section five we investigate the relationship between the models and functions.

Finally, some conclusions about this research are produced and are given suggestions for future research.

2 LITERATURE REVIEW

Today's competitive environment compels organizations to be innovative, knowledge driven and project oriented (Kerzner, 2009). The need for timely response to market changes, customer demands, and technology improvements leads organizations to develop their skills (Kotnour, 2011).

Knowledge and understanding of project management has grown and organizations recognize the importance of project management for business development (Santos, & Varajão (2015).

One important measure to improve project management is setting up a PMO. The PMO has become a very widespread and well-known organizational phenomena. In many organizations, people are being given the mandate to implement a PMO but without a clear image of what this might entail (Aubry, Hobbs & Thuillier, 2008).

Being a PMO an organizational entity that might have several roles and functions (Hobbs & Aubry, 2007), it is expected that the functions which are attributed are quite diverse, since they are associated to the complexity of the organization regarding project management, programs and portfolios.

The literature of PMOs manifests difficulties in providing a simple and accurate description of the functions and roles of PMOs because of a wide range of possible tasks assigned to PMOs and the responsibilities that PMOs adopt to fulfill the needs of the organizations.

2.1 Project and Project Management

Before understanding what is Project Management, it is required to know well what a project is (Kerzner, 2006). A project is a temporary endeavor to create a unique product or service in given periods of time with a determined budget (PMI, 2008).

Since projects are temporary in nature, the success of the project should be at least measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk as approved between the project managers and senior management (PMI, 2013).

Without well-defined processes, it is very difficult or almost impossible to achieve project's objectives (Liberato, Varajão & Martins, 2015). To an organization, project

failures often lead to financial loss, including significant losses in opportunity, competition, productivity, and employee morale (Williams, 2005).

According to Kerzner (2009), a project is an activity that could not be implemented without organizational procedures.

2.2 Project Management Office (PMO)

One effort in organizational project governance is the establishment and incorporation of a new entity, the PMO (Hobbs, Aubry & Thuiller, 2008), which may appear either alone in an organization or as multiple PMOs, charged with different project governance tasks, scope, and authorities (Tsaturyan & Müller, 2015).

The PMO is thus a unit or department, in matrix organizations or in project-based organizations, for developing of methodologies and institutionalizing project management practices (Kerzner, 2009).

According to Desouza & Evaristo, (2006), PMO is an exercise to customize and sustain the practices, methods, techniques, and tools in organizations. Dai & Wells, (2004) describe the PMO as an organizational unit that provides project managers, project teams, and functional managers with access to the principles, practices, methodologies, tools, and techniques that are used for efficient and effective project management.

The fundamentals of the PMO concept are not especially new. The project office associated with engineering, aerospace, and defense type projects, emerged in the 1950s as the scale and complexity of projects increased Desouza & Evaristo, (2006). However, it was not before the 1990s that this concept truly expanded into the forms we see today (Dai & Wells, 2004).

Some of this growth is attributed to Y2K projects, but more recently growth seems to have been driven by a desire to gain better control of project risks, standardize the use of project management methodologies, tools, and techniques, improve the monitoring of project performance, and manage and disseminate knowledge of project management practice, especially in Information Technology (IT), (Desouza & Evaristo, 2006).

The roles of PMOs can be segment into three levels: strategic; tactical; and operational (Desouza & Evaristo, 2006).

At an *operational* level, a PMO provides basic centralized support to individual projects and ensures professionalism and excellence in applying widely accepted principles and preferred project management practices to each project (Hill, 2004). This may include activities such as the selection and maintenance of a project management methodology, providing assistance to teams with logistics, production of regular reporting, risk assessment, and logging activities (Kutsch, Ward, Hall & Algar, 2015).

At a *tactical* level PMO services provide further added value through multi-project coordination and the management of cross-project dependencies. This may include resource integration across projects and ensuring that project management disciplines are adhered to.

Finally, the *strategic* PMO involves all aspects of an operational and tactical PMO and is also equipped with the authority to prioritize projects in relation to corporate objectives and strategies and advise senior management on the viability of project investments (Desouza & Evaristo, 2006).

2.3 Project Portfolio Management

Portfolio management focuses on ensuring that projects and programs are reviewed to prioritize resource allocation, and that the management of the portfolio is consistent with and aligned to organizational strategies.

To manage multiple projects successfully the organization needs to maintain control over a varied range of specialist projects, balance often conflicting requirements with limited resources, and coordinate the project portfolio to ensure that optimum organizational outcome is achieved (Dooley, Lupton & Sullivan, 2005).

2.4 Roles and Functions of PMO

Organizational structures, political factors, and cultural influences affect the ability to manage multiple activities and resources associated with projects that occur simultaneously. In order to facilitate such management a clear alignment of the project team is essential and one of the best ways to achieve this is to have a clear definition of the roles and functions of the PMO (Dinsmore & Cabanis-Brewin, 2010).

Historically the PMO typically assumed a limited number of functions: Project definition and planning; Cost and benefit analysis; Risk management; Monitoring and control; Support in the application of project management processes and procedures; Collection and dissemination of knowledge; Provide skills in project management; Standards and processes (Pellegrinelli & Garagna, 2009).

Currently, its main concerns are centered on project support; Consulting and mentoring; Methods and standards; Software tools; Training; Management of project resources (human and material) (Crawford, 2010).

According to Kerzner (2003), corresponding to the control of project management intellectual property, the following PMO functions have gained appropriate attentions: documenting lessons learned; dissemination of information; project management benchmarking; business case development; managing stakeholders; and capacity planning.

According to some authors (Artto et al., 2011; Crawford, 2010; Desouza & Evaristo, 2006; Hurt & Thomas, 2009), several responsibilities have been mentioned for PMOs: Aligning projects with organizational strategies; developing standards, processes, and methods; equipment and space in order to optimize organizational resource usage; monitoring project measures; monitoring and controlling organizational project; managing organizational projects risks; project portfolio management; capturing and utilizing lessons learned; training and mentoring project managers.

Another study that covered the roles and functions of the PMO are researched by Hill (2008), showed in Table 2.1. It groups the roles and functions of the PMO.

GROUPS	FUNCTIONS
Group 1 - Practice Management	Project Management Methodology Project Tools Standards and Metrics Project Knowledge Management Project
Group 2 - Infrastructure Management	Project Governance Assessment Organization and Structure Facilities Equipment Support
Group 3 - Resources Integration	Resource Management Training and Education, Career Development Team Development
Group 4 - Technical Support	Mentoring Project Planning Project Auditing Project Recovery

Table 2.1 – PMO Functions, Adapted from (Hill 2008)

2.5 Conceptual Framework of PMO Functions

Hobbs & Aubry (2007) provide the most grounded exploration of the functions PMOs performed in organizations. Using a comprehensive list of functions developed from the literature and from a previous phase of the research project, their research proceeded through a multistep process of refinement. The study had 500 respondents with a variety of roles, but most were project managers or working in the organization's PMO.

The respondents reported the importance of each function for their PMO using a scale ranging from 1 ("not important at all") to 5 ("very important").

Based on this research, 27 important functions were identified. These functions represent the most common services provided by PMOs and have been used by several authors in their research, and will be used in this study to answering to second research question.

Regarding the results, 21 of the 27 functions are important for at least 40% of PMOs. However we need to be aware that some functions are relatively recent and may not have been have assimilated by PMOs.

For example, program management (48%) and portfolio management (49%), only recently became the focus of attention of the development of project management in organizations. Benefits management (28%), is an even more recent phenomenon in the project management community and literature. Many community members are still unfamiliar with this practice, which may explain why it is considered relatively less relevant.

Analyzing 27 different functions is quite fastidious. Identifying groups of functions greatly simplifies interpretation and use of this data. Hobbs & Aubry (2007) used factorial analysis to identify such groupings.

Functions that are grouped together through factorial analysis are tightly associated statistically with each other, and statistically independent from the other functions and groups of functions (MacCallum et al., 1999).

The conceptual grouping of the functions allows the simplification in the analysis. Factor analysis grouped the functions into five distinct groups as reflected in Table 2.2.

The authors identified the functions of Group 1 "monitoring and controlling project performance", as the most important since they directly supports management, producing the necessary information to the decision making and projects' control. The

PMO which play these roles provide information to management in order to control the projects' performance, acting as a support of the projects governance.

Group 2, "development of project management competencies and methodologies", is identified as the "most traditional". The functions of this group are not directly related to performance, being centered in the development and training of the project managers, as well as in the definition of methodologies.

Group 3, "multi-project management", includes functions related with the direct management of the projects, programs and portfolios, as well as with the allocation of resources and coordination between projects that were planned or being executed in the organization.

The coordination of interdependencies between programs and portfolios are a central point in the management of multi projects.

Group 4, "strategic management", involves the functions which bring closer the PMO and the senior management, allowing the PMO to be more involved in the organization strategic alignment. Include benchmarking analysis, strategic planning and advice to the top management.

The functions associated to group 5, "organizational learning", are related to disseminating and archiving information of the projects to the benefit of future projects. This group includes functions associated to the performance of audits, evaluations and lessons learned (which are many times neglected by the project teams).

The functions, "Execute specialized tasks for PMs", "Manage customer interfaces", "Recruit, select, evaluate and determine salaries for PMs", that were not included in these groups, complete the list of 27 functions identified in the study.

These three functions are excluded from the groups above, because their presence is neither statistically nor conceptually related to these groups.

FUNCTIONS		Relevance (%)
Group 1 - Monitoring and Controlling Project Performance		
	Report project status to upper management	83%
	Monitoring and control of project performance	65%
	Implement and operate a project information system	60%
	Develop and maintain a project scoreboard	58%
Group 2 - Development of PM Competencies and Methodologies		
	Develop and implement a standard methodology	76%
	Promote project management within the organization	65%
	Develop competency of personnel, including training	55%
	Provide mentoring for project managers	49%
	Provide a set of tools without an effort to standardize	42%
Group 3 - Multi-project Management		
	Coordinate between projects	59%
	Identify, select and prioritize new projects	48%
	Manage one or more portfolios	49%
	Manage one or more programs	48%
	Allocate resources between projects	40%
Group 4 - Strategic Management		
	Provide advice to upper management	60%
	Participate in strategic planning	49%
	Benefits management	28%
	Networking and environmental scanning	25%
Group 5 - Organizational Learning		
	Monitor and control the performance of the PMO	50%
	Manage archives of project documentation	48%
	Conduct post-project reviews	45%
	Conduct project audits	38%
	Implement and manage database of lessons learned	44%
	Implement and manage risk database	29%

Table 2.2 – PMO Functions, Adapted from (Hobbs & Aubry, 2008)

3 METHODOLOGY

This section presents the data collection methods, the research design, and analysis approaches in order to address the research question.

3.1 Data Collection Method

To identify earlier research we performed several ad-hoc queries using databases and search engines provided by well-known publishers. In addition, we performed some general searches using Google Scholar. These searches made it clear that relevant articles have been published in a variety of journals. We found that the Project Management Journal, International Journal of Project Management, International Journal of Information Systems and Project Management, PM World Journal, and Information System Management, for example, have published articles bearing upon the research question. Some results point us to books as well.

We therefore decided not to concentrate on particular journals, but to search the following databases available to us, which were:

– Web of Science (https://webofknowledge.com);
– Scopus (http://www.scopus.com);
– Elsevier Science Direct (www.sciencedirect.com);
– Emerald (www.emeraldinsight.com);
– ACM Digital Library (portal.acm.org/dl.cfm);
– Taylors Francis Online (www.tandonline.com).

We used the following terms and synonyms in our queries:

– “project management office”;
– “pmo type”;
– “pmo model”;
– “pmo typology”;
– “pmo typologies”;
– “pmo framework”;
– “pmo functions”;
– “pmo roles”;

– “roles and functions of pmo”;
– “organizational project management”;
– “project management maturity”;
– “project governance”.

3.2 Data Gathering

In the first inclusion criterion, the articles were selected for further analysis mainly on the basis of the title and the abstract. After the articles had been identified we eliminated duplicate titles that were obtained in more than one search engine. For this purpose the software Mendeley was used.

All titles and abstracts were read in order to remove the articles not related to the scope of this research, which resulted in 66 selected articles. However, the abstract did not always provide enough information to decide whether the article included relevant information or not. Often, to decide whether an article, was needed to read the full article. Related to the books selection, we first read the table of contents to decide if it was useful to explore the full content.

The second inclusion criterion was applied during the full reading of the articles, resulting in 26 articles. The thematic analysis method (Thomas & Harden, 2008) was used to synthesize the data extracted from the primary studies. This method is used in qualitative research and is composed of three phases: pre-analysis; material exploration; and results treatment and interpretation.

4 PMO TYPOLOGIES AND MODELS

A Typology is “a system used for putting things into groups according to how they are similar; the study of how things can be divided into different types [or models]; the study of analysis or classification based on types or categories” (DM, 2014).

A PMO Model it is an organizational type of structure design based within and upon both project management and operations business management, which provides a coherent and supporting narrative for a PMO. It can be used to describe and classify various PMO organizations, which can then be used by an enterprise as the basis for organizational development when creating new organizational structures or changing existing organizational structures to drive and create business value (Hubbard & Bolles, 2015).

4.1 PMO Typologies

Based on the creation of typologies of organizational structures performed by Mintzberg (1979), several authors developed different typologies of PMO. These typologies, supported by models, are the simplification and reduction of reality, being useful to support research and studies (Hobbs & Aubry, 2007).

The conception, configuration and management of PMO is still hampered by the diversity of the PMOs existing in the organizations and the lack of consensus regarding its structure and performed functions, made impossible the universal recognition of a typology (Hobbs & Aubry, 2008).

Most of the existing typologies is a combination of functions and the authority given to PMO. Each typology compares the functions with the authority and its positioning in the organizational structure, being organized in an incremental way according to its degree of responsibility. The selection of the model is determined by the nature of the projects and by the degree of the organizational maturity in project management (Verzuh, 2005).

4.2 PMO Models

Many books and articles about project management have been published in recent years, with some of them promoting the implementation of PMOs (Hobbs &

Aubry, 2007). Analyzing these works produces an image of PMOs characterized by variation in the name, structure, roles assumed, and perceived value.

Different authors have proposed models to classify the major services offered by a PMO (Pansini, Terzieva & Morabito, 2014]. The descriptions of PMOs in the literature are often summarized in types, in which each type is a model of a PMO. Any model is necessarily a simplification and a reduction of the complexities of organizational reality. Models are useful, even necessary, to support both research and practice (Hobbs & Aubry, 2008).

The PMO model, in general, is a type of business-oriented organizational structure that supports the enterprise's business strategy and business development, and describes the typologies comprising few models.

The most common typologies have three to five proposals for how a project management organization and project-portfolio management organization, – collectively PMOs – initiate, create, capture, and deliver value within an enterprise.

Overall, it is an organizational structure design based within and upon both project management and business management (Hubbard & Bolles, 2015).

In the following subsections we present several typologies of PMO models found in the literature, making a brief description of the characteristics of each.

4.3 Typology 1

Englund, Graham & Dinsmore (2003) propose three PMO models. The first, *Project Support Office*, provides internal consulting for project management activities, such as planning and scheduling, project management tools, and document management. The second, *Project Management of Center of Excellence*, includes functions aimed more at assuring up-to-date methodologies and skills in project management, such as standardization of processes, identification of best practices, and training. The third is *Program Management Office*, which promotes complete authority over the projects and responsibility for recruiting and developing project managers, project selection, and alignment of priorities with the business strategies.

4.4 Typology 2

Kendall & Rollins (2003) propose four PMO models. The *Project Repository Model* emphasizes tools and data. This model assumes that the enterprise has adopted a cohesive set of tools for project design, management, and reporting. The *Project Coaching Model* is an extension of the *Repository Model*, and provides training, mentoring, and other assistance to project managers. The *Enterprise PMO* oversees the project management and function, assuming a governance of project that will involve the EPMO in all projects regardless of size. Finally, the "*Deliver Value Now*", provides focus on the total project portfolio linked to the organization's goals and assets. It is guided by full executive support.

4.5 Typology 3

Garfein (2005) proposes four models of PMO. The *Project Office*, which provides data to a higher level PMO or other oversight authority for consolidation. The *Basic PMO*, which develops a process and criteria for project selections, and compiles performance data from multiple projects. The *Mature PMO*, which aligns projects with business strategy, and implements a process for assessing and allocating resources, and develops methods for prioritizing projects. And the *Enterprise PMO*, which enables real-time project data in decision making and creates an overall capacity of the project portfolio management.

4.6 Typology 4

Letavec (2006) proposes three models. A *Consulting PMO* addresses the project management needs of the organization primarily though mentoring and promotes a sense of project management community in the organization, and is responsible for day-to-day management of projects. The *Knowledge (Strong) PMO* serves as the central project and program management body in the organization, exerts significant influence over the standards and processes that govern the projects in the organization, and plays the role of a knowledge organization maintaining project libraries, lessons-learned, and building organizational best practices in the project management. The *Standard*

(Blended) PMO provides consulting services, training, and standards-setting activities and is often regarded as a center of expertise for project management in organizations. Its role across organizational boundaries is to identify best practices and to implement standards and tools for the benefit of the entire project community.

4.7 Typology 5

Desouza & Evaristo (2006) have identified four PMO models. The *Supporter* serves primarily as an administrative function by providing project status, identifying risks and potential issues, and maintaining project archives. It has no control over project management practices and no responsibility for them, which remains in the functional departments of organizations. The *Information Manager* function is to track and report the progress of the projects with the aim of serving as a source of information about projects and consolidating update status. It is a knowledge-intensive PMO that also assumes administrative functions, however rarely takes the initiative and has no authority over the projects. The *Knowledge Manager* is a repository of the best practices, providing project expertise, mentoring, and training. It is recognized by the authority of organization in knowledge related to the project management. The *Coach* It is the most intensive model in knowledge management, emphasizes improvement, excellence, and responsibility to enforce the project management practices on the organization.

4.8 Typology 6

Gartner Research Group (2008), in his first research on the PMO in 2002, Gartner reported three different types of project Models (*Repository*, *Coach*, and *Manager*). In 2008 Gartner made an update and proposed five models instead of three. The *Project Support Office* is a formal organization established to support the needs of the community of project managers, providing simple cycle life support and hands-on project assistance on resourcing, scheduling, and scoping. The *Program Management Office* is a centralized control seeking to establish a consistent baseline of processes, adding formalized project tracking and reporting. The *Project Management of Center of Excellence* model focuses on increasing the efficiency of investing in people through

mentoring, upgrading skills, and sharing tacit knowledge between project managers. The *Federated* PMO consists of a corporate PMO and a number of Unit/Division PMOs in which the corporate PMO takes responsibility for methods, training, and tools while the Unit/Division PMOs are directly responsible for project reporting, oversight, and delivery. The *Enterprise* PMO has the role of reporting and oversight of major company initiatives and can be expanded to a strategy support office with responsibility for scenario planning and strategic analysis.

4.9 Typology 7

Hill (2008) proposes five PMO models that represent a progressive advance and competency of the functionality in project management. The *Project Office* provides the capability to ensure professionalism and excellence in applying widely accepted principles and preferred project management practices to each project effort. The *Basic PMO* is the first PMO whose level deals with multiple project oversight and controls the ability to provide aggregate oversight and control of multiple projects relative to the performance of multiple project managers. The *Standard PMO* introduces centralized oversight and control, and supports the project management environment, seeking to implement project management as a core business competency. The *Advanced PMO* is the "big brother" of the *Standard PMO*. Its focus is integrating the business interests and the objectives into the project management environment, creating a "projected" business environment. The Project Management of *Centre of Excellence* has a focus on strategic business interests across the organization, having direct access to the chief executive officer, and providing directions to influence the company's project management operations.

4.10 Typology 8

Kerzner (2009) proposes three models of PMOs. *Functional* is used in one functional area or division of an organization, such as information systems. The major responsibility of this type of PMO is to manage a critical resource pool, that is, resource management. The *Customer Group* is for better customer management and customer communications. Multiple customer group PMOs can exist at the same time and may end up functioning as a temporary organization. This type of PMO will have a permanent

project manager assigned to manage projects. The *Enterprise* or *Strategic Model* serves the entire company and focuses on corporate and strategic issues rather than functional issues. If this type of PMO addresses management projects, it is for cost reduction efforts.

4.11 Typology 9

Crawford (2011) presents three different models of PMO. The *Project Control Office* typically handles large and complex single projects. It is specifically focused on one project, but that one project is so large and so complex that it requires multiple schedules, which may need to be joined into an overall program schedule. The *Business Unit PMO* is to manage a large number of multiple projects of varying sizes, from small short-term initiatives that require few resources to multi-month or multi-year initiatives requiring dozens of resources, large investments, and complex integration of technologies. It also provides a much higher level of efficiency in managing resources across projects and identifying the priorities of projects. The *Strategic or Enterprise PMO* considers an organization with multiple business units, multiple support departments, and ongoing projects within each unit. Only a corporate-level organization can provide the coordination and broad perspective needed to select and prioritize projects that will engage better strategic support by tracking projects and programs that contribute to support strategic and corporate objectives.

4.12 Typology 10

Unger, Gemünden & Aubry (2012) introduce three models of PMO. The first is *Supporting*, which involves providing services to project members and project leaders during project implementation, including activities to train and motivate project management standards and operations within the organization. The second, *Controlling*, involves information management to deliver input in decision making, including gathering, preparing, and providing information as well as suggesting corrective measures. Third is *Coordinating*, which includes project appraisal, selection, cross-project support, crossing-department coordination and coaching parties to improve collaboration between stakeholders.

4.13 Typology 11

The Project Management Institute (2013) proposes five PMO Models. The *Project Specific* provides project-related services as a temporary entity established to support a specific project or program. *Business Unit PMO* provides a project-related service to support a business unit including the portfolio management, the operational project support, and human resources utilization. The *Project Support Office* uses the governance of processes, practices, and tools established by the organization, and provides administrative support for delivering the project. The *Enterprise PMO* is responsible for aligning project and program work to corporate strategy, establishing and ensuring appropriate enterprise governance, and performing portfolio management functions to ensure strategy alignment and benefits realization. The Project Management of *Centre of Excellence* supports project work by preparing the organization with methodologies, standards, and tools to enable project managers to better deliver projects.

4.14 Typology 12

Bolles & Hubbard (2015) propose five PMO Models. The *Project Office* (single project) and the *Project PMO* (major project), which we have grouped into *Project Office/PMO*. This Model provides management of a single, mission-critical or major project, develops project operational plans and budgets, and authorizes adjustments. Control reports up-date progress and maintain project documentation. The second model is *Project Support Office*, which provides administrative support to one or more non-complex and report projects, providing project controls. The *Division PMO* and *Business Unit PMO* we have grouped into a *Division/Business Unit PMO*, which provides project business management across the organizations, manages portfolios, and oversees programs. The *Enterprise PMO* provides project business management on an Enterprise-wide basis, overseeing division and business unit PMO, project selection, and prioritization. Finally, the *Project Management Centre of Excellence* establishes and implements project business management standards, methodology, practices, education, training, and project management competency on an enterprise-wide basis.

4.15 Discussion

The descriptions of PMOs in the literature are often composed from several models that are grouped into one typology

Each typology proposes two, three or four multiple project PMOs, organized in an ascending hierarchy. The PMO progression is to follow an incremental path from a lower level to a high level model

We identified 47 models in the literature review. All the models and typologies are presented in Table 4.1. Horizontally in the lines we show the functions inserted in which group and vertically in the columns are presented the models obtained from the literature.

The table 4.2 presents another perspective of the models proposed by the authors, identifying the number of occurrences of the models in the typologies.

It was concluded that some names of the models are common across different typologies. Considering this fact, the number of models was reduced to 25 unique models, represented on Figure 4.1 witch presents a ranking of models considering their presence in the typologies.

The models *Enterprise PMO*, *Project Management of Center of Excellence*, *Project Office*, and *Project Support Office*, are the most common in the typologies.

Most authors consider in their typologies the models that have the responsibility of managing a single project, often called Project Office. These models are created by a temporary need of the organization, for example a project to joining two companies.

The organizational structure are created with teams, schedules, and costs but have a limited time of duration. When the project is completed this temporary structure is closed.

It seems that some PMO are implemented to meet certain objectives and they are dissolved immediately after accomplishment reflects organizational efficiency.

However, PMOs are usually associated with models that have a multi-project function and still in the organization beyond the defined term of a given project.

Authors	PMO Models				
Englund, Graham & PC Dinsmore, (2003)	Project Support Office	Project Management Center of Excellence	Program Management Office		
Kendall & Rollins, (2003)	Project Repository	Project Coaching	Enterprise PMO	"Deliver Value Now"	
Garfein, (2005)	Project Office	Basic PMO	Mature PMO	Enterprise PMO	
Craig Letavec, (2006)	Consulting PMO	Knowledge (Strong PMO)	Standards (Blended PMO)		
Kevin Desouza & Roberto Evaristo, (2006)	Supporter	Information Manager PMO	Knowledge Manager PMO	Coach PMO	
Gartner Research Group, (2008)	Project Support Office	Program Management Office	Project Management Center of Excellence	Federated PMO Program Offices	Enterprise PMO
Gerard M. Hill, (2008)	Project Office	Basic PMO	Standard PMO	Advanced PMO	Project Management Center of Excellence
Kerzner H., (2009)	Functional PMO	Customer Group	Enterprise PMO		
J K Crawford, (2011)	Project Office	Business Unit PMO	Enterprise PMO		
Unger N, Gemünden G, & Aubry M, (2012)	Supporter	Controller	Coordinator		
PMI, (2013)	Project Office	Departmental / Business Unit PMO	Project Support Office	Enterprise PMO	Project Management Center of Excellence
Dennis L. Bolles & Darrel G. Hubbard, (2015)	Project Office / PMO	Project Support Office	Departmental / Division / Business Unit PMO	Enterprise PMO	Project Management Center of Excellence

Table 4.1 – Typologies and Models in the Literature

PMO Models	Englund, Graham & Dinsmore (2003)	Kendall & Rollins (2003)	Garfein (2005)	Letavec (2006)	Desouza & Evaristo (2006)	Gartner - Fitzgerald (2008)	Hill (2008)	Kerzner (2009)	Crawford (2011)	Unger, Gemünden & Aubry (2012)	PMI (2013)	Bolles & Hubbard (2015)
	Authors/Typologies											
Project Repository		X										
Project Coaching		X										
Deliver Value Now		X										
Mature PMO			X									
Consulting PMO				X								
Knowledge PMO				X								
Standards PMO				X								
Information Manager					X							
Knowledge Manager					X							
Coach					X							
Standard							X					
Advanced							X					
Functional								X				
Customer Group PMO								X				
Federated PMO						X						
Project Support Office	X					X					X	X
PMoCE	X					X	X				X	X
Program Management Office	X					X						
Supporter					X					X		
Enterprise PMO		X	X			X		X	X		X	X
Project Office			X				X		X		X	X
Basic PMO			X				X					
Business Unit PMO									X		X	X
Controller										X		
Coordinator										X		

Table 4.2 – PMO Typologies *vs.* Models

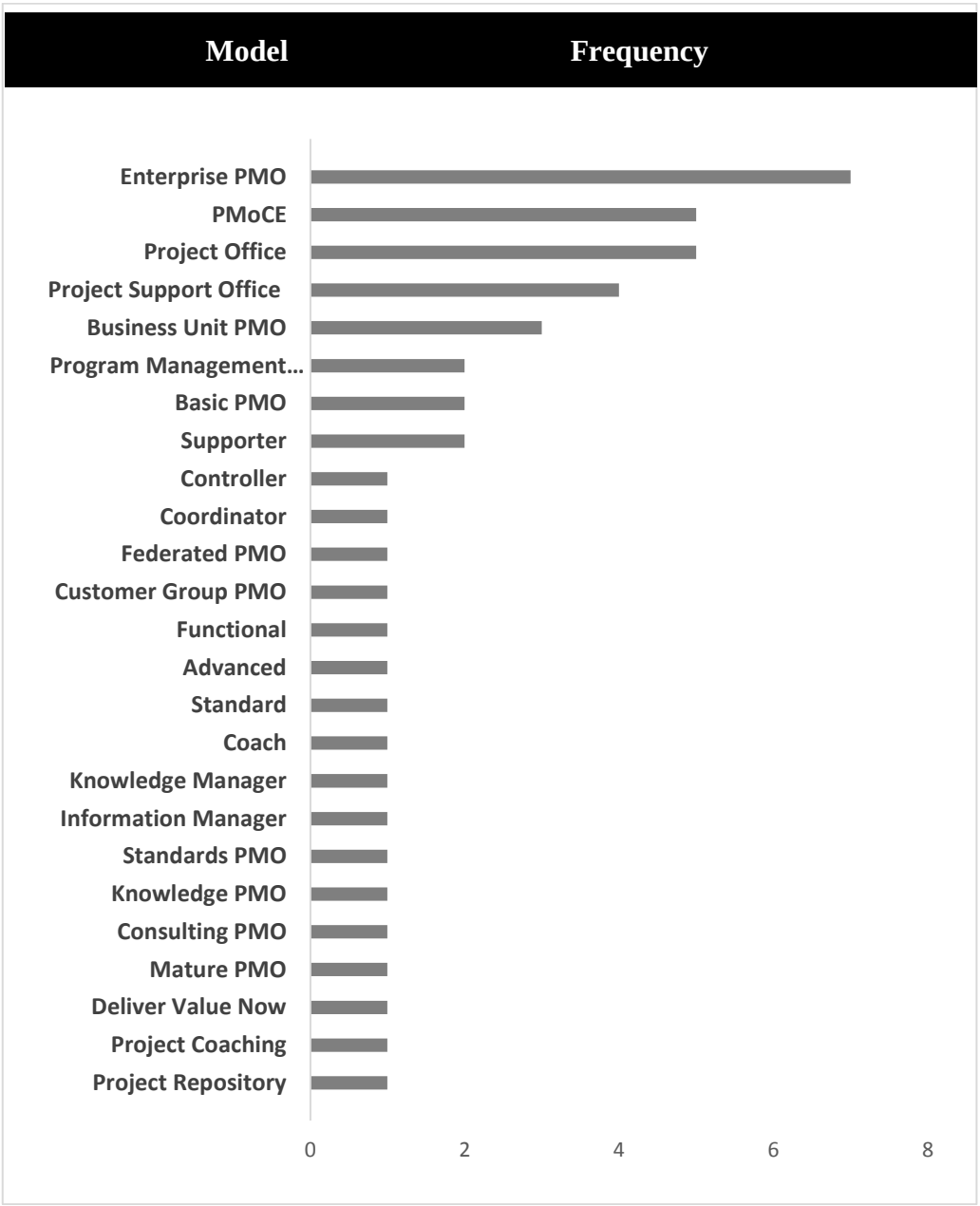

Figure 4.1 – PMO Models, ranked by frequency in typologies

5 PMO MODELS AND FUNCIONS

A PMO model must be chosen in an organization according to the functions that are intended to be assigned to this organizational structure. Many more functions, the greater will be the importance and responsibility within the organization.

The challenge therefore, is to adapt each model with the functions that are considered relevant to manage projects in the organization.

To obtain the results, functions were analyzed in each of the models and related to the functions of the study of Hobbs and Aubry (2007). Therefore a distribution of all the PMO functions was obtained from the models of each typology.

Table 5.1. identifies which functions are included with each one of the models proposed by the authors, aims at answering to our study's third research question.

Horizontally, in the lines, the functions are organized in groups following the study of Hobbs & Aubry (2007). Vertically, in the columns, are presented the models identified in the literature

5.1 Discussion

Through a superficial analysis of table 5.1 some preliminary conclusions can be drawn. The functions that belong to the group "Monitoring and Controlling Project Performance", are present in the most of the PMO models, which seems to indicate that they are used in the lower level of the typologies. In the opposite, the functions that are included in group "Strategic Management", are the less common in the PMO models, which seems to indicate that they will only be used in the higher levels of the typologies, and probably a relation exist between the level of PMO and the positioning in the organizational structure.

Analyzing in deep the functions that belongs to "Strategic Management", such as, "Participate in strategy planning" and, "Provide advice to upper management", seems to follow that the PMO with this functions have a strategic role and will be supported by senior management. Enterprise PMO seem to be suitable for this kind of organizations.

TP1			TP2				TP3				TP4			TP5				TP6					TP7					TP8			TP9			TP10			TP11					TP12					Functions of the PMO
Project Support Office	Program Management Office	PMoCE	Project Repository	Project Coaching	Enterprise PMO	Deliver Value Now	Project Office	Basic PMO	Mature PMO	Enterprise PMO	Consulting PMO	Strong PMO	Standards PMO	Supporter	Information Manager	Knowledge Manager	Coach	Project Support Office	Project Management Office	PMoCE	Federated PMO	Enterprise PMO	Project Office	Basic PMO	Standard	Advanced	PMoCE	Functional PMO	Group PMO	Enterprise PMO	Project Control Office	Business Unit PMO	Enterprise PMO	Supporter	Controller	Coordinator	Project Specific	Project Support Office	Business Unit PMO	Enterprise PMO	PMoCE	Project Office	Project Support Office	Business Unit PMO	Enterprise PMO	PMoCE	Grouping Functions: • Monitoring • Methodologies • Multi-Project • Strategic • Organizational
																																															Monitoring and Controlling Project Performance
	x		x	x	x	x	x		x	x	x	x	x	x	x		x		x		x	x	x	x	x	x		x	x		x	x	x	x	x	x		x	x	x		x	x	x	x		Report project status to upper management
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Monitoring and control of project performance
x	x	x		x	x	x		x	x	x	x	x	x	x		x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x		x	x	x		Implement and operate a project information system
	x		x		x	x		x	x	x		x	x	x			x		x			x		x	x	x		x	x			x	x		x	x	x		x	x		x	x	x	x		Develop and maintain a project scoreboard
																																															Development of PM Competencies and Methodologies
x	x	x			x	x		x	x	x		x				x	x	x		x	x	x			x	x	x		x	x		x	x	x	x	x		x		x	x		x		x	x	Develop and implement a standard methodology
	x	x			x	x			x	x		x					x			x		x				x	x			x		x	x							x	x				x	x	Promote project management within the organization
	x	x		x		x					x		x			x				x	x	x				x	x		x	x		x		x							x					x	Develop competency of personnel, including training
	x	x		x		x					x		x			x				x	x	x				x	x		x	x		x		x							x					x	Provide mentoring for project managers
	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x		x	x			x		x	x	x	x	x	x		x		x	x	x	x		x	x	Provide a set of tools without an effort to standardize
																																															Multi-project Management
	x				x	x			x	x		x					x					x			x	x			x			x	x			x			x	x				x	x		Coordinate between projects
	x	x			x	x		x	x	x		x					x					x				x			x	x			x			x			x	x				x	x		Identify, select and prioritize new projects
	x				x	x				x		x					x					x				x			x				x			x			x	x				x	x		Manage one or more portfolios
	x				x	x				x		x					x					x				x			x				x			x			x	x				x	x		Manage one or more programs
	x				x	x			x	x		x					x					x				x		x	x			x	x			x			x	x				x	x		Allocate resources between projects
																																															Strategic Management
	x	x		x		x			x	x		x					x				x	x			x	x			x	x			x			x			x	x				x	x		Provide advice to upper management
	x					x				x		x					x					x				x			x				x			x				x					x		Participate in strategic planning
	x					x				x		x					x					x				x			x				x			x				x					x		Benefits management
	x					x			x	x		x					x					x				x			x				x			x				x					x		Networking and environmental scanning
																										x																					**Organizational Learning**
	x			x	x	x			x	x		x					x					x		x	x	x			x			x	x		x	x			x	x				x	x		Monitor and control the performance of the PMO
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Manage archives of project documentation
	x			x	x	x		x	x	x		x					x		x			x				x			x			x	x		x				x	x				x	x		Conduct post-project reviews
	x			x	x	x		x	x	x		x					x		x			x				x			x			x	x		x				x	x				x	x		Conduct project audits
x	x				x	x		x	x			x	x			x	x	x			x	x			x	x			x	x		x	x	x		x		x	x	x		x		x	x		Implement and manage database of lessons learned
x	x		x	x	x			x	x			x	x			x	x		x		x	x			x	x			x		x	x	x					x	x	x			x	x	x		Implement and manage risk database

Table 5.1 – PMO Models *vs.* Functions

6 CONCLUSIONS

We have analyzed several PMO models found in literature. The results show that the structures, roles, functions, and descriptions of PMOs vary considerably from one source to another. In fact, authors establish a great variety of different PMOs. We have identified a total of 47 PMO Models in the literature review, but some models share the same names, reducing the number of unique models to 25.

The authors propose three, four, or five PMO models in their typologies. In many cases, the position of a PMO within a hierarchical organization (strategic, tacit, or operational) establishes its degree of authority, acceptance, adoption, and autonomy, for defining, distributing, and supporting project management practices somewhere within the enterprise (Bolles & Hubbard, 2015).

Based on the research of Hobbs and Aubry (2007) regarding the functions which a PMO can have, we related those functions with the PMO models previously investigated.

Different authors use different characteristics to move from a PMO model to another model and the progression of a PMO seems to follow an incremental path from a low decision level to a high level. This progression sometimes is related with a higher number of functions which are attributed to the PMO.

It is presumed that a higher-stage PMO has already achieved the competencies prescribed for any lower-stage PMOs. Thus, if an organization wants to establish for example a *Stage 3*, it will also have to ensure it has first implemented the functions and achieved the competencies defined for *Stage 1* and *Stage 2* of PMOs.

Two main factors define the implementation level of PMO (Verzuh, 2005): the functions and the authority, being possible to create a variety of combinations (functions *vs.* authority) to achieve the specific needs in project management of each organization.

6.1 Contributions and Recommendations

The aim of this research has been to exploit a rich set of descriptions of PMOs, to identify patterns among PMOs, and to identify the typologies of PMOs together with the main functions. Data on both the organizational context and the characteristics of PMOs were explored.

The underlying premise of the PMO models presented here is that the PMO is a business integration activity. Not all organizations may need to evolve to higher level to achieve their organizational objectives. It is also unlikely that any individual PMO will implement all functions without a higher level of maturity in project management and with the engagement of senior managers.

There are a variety of models and functions that the PMO can assume, depending on the stage of evolution of the organization, discipline, type of organizational structure, among other factors.

In the implementation of the PMO, organizations should previously analyze the functions (responsibilities) to identify which core functions will satisfy the needs of the business, and the power (authority) of the PMO to align the functions with the objectives assigned.

Organizations only succeed when they have effective strategy execution, and PMOs can, and should, play a vital role in achieving that goal.

The selection of the model should be determined by the type of projects and the level of maturity of the organization in project management.

6.2 Limitations and Future Research

PMOs are an important aspect of project management practice. Their design and management is complex process by the great variability found among PMOs in different organizations. Having a typology of PMOs can make this great variability much more manageable.

This research has limitations mostly due to its explorative nature. In this research we limit data presentation to snapshots of current PMOs and their main functions. We are aware that more advanced analysis is needed and it will be planned for the next step of our research.

This analysis will be developed in future work and will help to consolidate some of the proposed models. Future research will provide insights into the following two questions:

- Based on a deep characterization of the PMO models that were presented in our research, is it possible and/or useful to develop and suggest a new PMO unified typology?
- It is possible to establish the relationship of the level of maturity with the stage of PMO in organizations.

The analysis presented here makes several contributions to the study of PMOs and can be useful for an organization as the basis of knowledge when creating new organizational project management structures or changing existing ones to drive and achieve business value. It is also provides a basis for further research on PMOs.

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