PROPOSAL FOR A PROJECT MANAGEMENT OFFICE CHARACTERIZATION FOR A BRAZILIAN PUBLIC UNIVERSITY

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Agradecimentos

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Resumo

The need to improve tools, skills, and techniques shows the project management as an important instrument of development, organizational change and a way to reach the strategic objectives of organizations. In the Public Sector, more specifically the Education sector, this issues are constantly being discussed as a way to improve the control e the efficiency of resources use. This paper has as general objective to propose the characterization of a model of Project Management Office for the strategic projects in a Brazilian Federal University (UFB), focusing in identify in a literature review the most used PMO models and define which of them can be used in the University's PMO. Findings analyze the model that works best for the management of UFB's strategic projects and made possible several contributions that can bring benefits to the university. These contributions stand out: the ability to maximize the resources needed for the UFB; the capacity to generate knowledge in this area making possible great advances for the management of the university's strategic projects; the ability to generate tools that support decision making; the ability to provide support in processes increasing the success rate in projects.

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ABSTRACT

The need to improve tools, skills, and techniques shows the project management as an important instrument of development, organizational change and a way to reach the strategic objectives of organizations. In the Public Sector, more specifically the Education sector, this issues are constantly being discussed as a way to improve the control e the efficiency of resources use. This paper has as general objective to propose the characterization of a model of Project Management Office for the strategic projects in a Brazilian Federal University (UFB), focusing in identify in a literature review the most used PMO models and define which of them can be used in the University's PMO. Findings analyze the model that works best for the management of UFB's strategic projects and made possible several contributions that can bring benefits to the university. These contributions stand out: the ability to maximize the resources needed for the UFB; the capacity to generate knowledge in this area making possible great advances for the management of the university's strategic projects; the ability to generate tools that support decision making; the ability to provide support in processes increasing the success rate in projects.

Key-Words: Project Management, PMO, Project Management Office, University

1. INTRODUCTION

The performance scenario of organizations is increasingly dynamic, competitive and globalized (Rego & Silva, 2011; Monteiro et al., 2016.). In this context, the need to improve tools, skills, and techniques, emerges as well as new alternatives and attempts to overcome these challenges, that shows the project management as an important instrument of development, organizational change (Alves *et al.*, 2013) and a way to reach the strategic objectives of organizations (Barcauí & Quelhas, 2004a).

Project management within organizations, however, is steadily growing, especially considering the high failure rates in projects (Thorn, 2003), as well as the structure of many companies that are not prepared to deal with turbulent environments, with the scarcity of resources and projects becoming more numerous and complex (Aubry et al., 2007). Therefore, it is shown the need of centralizing control, resources, information, and management in a more formal unit bringing the Project Management Office (PMO) as a structure capable of meeting this need (Barcauí & Quelhas, 2004).

The necessity of project culture is very present in Brazilian public universities (Moutinho & Kniess, 2012) that constantly need to seek resources from development agencies, government programs, public-private partnerships, among others. This search becomes more complicated due to the current conjuncture of the Brazilian public education, affected by cuts in the budget and investments. In the case of the Brazilian Federal University (UFB), through the current scenario, it is considered the implementation of a PMO as a possible response to the mitigation of this problem, raising the question: what would be the best characterization of a model of project management office for the UFB?

This study has as its **main objective** to propose the characterization of a model of Project Management Office for the strategic projects of the Brazilian Federal University (UFB), to do so we have as **specific objectives**: i) study the PMO models that are currently available; ii) map the management structure of strategic projects currently practiced at UFB and; iii) analyze the model that works best for the management of UFB's strategic projects.

The present **study** has as its justification the growing discussion, in the global scenario, of the Project Management Offices use as a means of guaranteeing success and

improvement in project management, however, it is mainly based on the capacity of this tool to provide financial, operational and management benefits for UFB.

The section 2 of this paper presents the theoretical revision that underlies this research; section 3 presents the methodology applied for the carrying out consummation of this study; section 4 demonstrates the results and discussions, subdivided into awareness, suggestion, development. Lastly, in section 5 are made the final considerations of this study.

2. PROJECT MANAGEMENT OFFICE

The project management offices emerged as departments restricted to large projects and their administrative support (Kerzner, 2003). However, this concept has beend improved, bringing several definitions that are mainly associated to the fact that they are a formally constituted organizational structure (Anselmo & Maximiano, 2006; Aubry et al., 2008) that seeks through the utilization of tools, processes (Cleland & Ireland, 2000; Crawford, 2000; Maximiano, 2006), methods, techniques (Patah, 2004; PMI, 2013) metrics, standards and training (Anselmo & Maximiano, 2006), to support the decision-making regarding the project portfolio management (Aubry et al., 2008; Crawford, 2000; Patah, 2004), being able to manage this portfolio of projects (Valeriano, 2001; Anselmo & Maximiano, 2006).

As well as its conceptualization, the PMO has a variety of responsibilities, characteristics, and functions assigned to it, which are closely linked to the maturity level of the project management from an organization, its organizational structure (Barcauí & Quelhas, 2004b), and especially the model or type of PMO implanted and consolidated.

2.1 Theoretical models

By the light of stakeholders, the PMO *Server*, *Controller*, and *Partner* models can be found, respectively distinguished, by the level of knowledge exchange offered to all interested parts. In the *server* type, the PMO has the purpose of providing operational support through the application of tasks and consultancies aiming the increase in efficiency and effectiveness. In the *controller* type, the PMO has as a purpose the realization of standards, methods and management tools of projects aiming the control of defined metrics and evaluation of performance. And *PMO's* partners are responsible for sharing and exchanging knowledge by envisaging a reciprocal relationship between stakeholders (Aubry et al., 2013).

On the other hand, the size of *the Administrative Office* has the purpose of managing the information related to the projects, their tasks and resources, directing them to their respective managers of intensive knowledge that the focus is on the development and expansion of the performance improvement, through the management of the best practices, the increasing of maturity and learning, such as successes and failures, aiming the management of internal and external information (Evaristo, 2006).

However, there are other models that can be classified according to their hierarchical level, such as: I) the *Project Support Offices*, which are intended to plan and schedule activity and tools through internal consultancy for better management of documents and of projects; II) the *Project Management Centers of Excellence*, which are designed to ensure methodologies, best practices and training to standardize project management processes; III) *Program Management Offices*, which have full authority over the projects selecting and developing the projects and their managers and aligning them with the organization's strategies (Dinsmore et al., 2003).

Along this same path, there are also: I) *Control Offices*, which are in charge of preparing reports, monitoring indicators, performing day-to-day tasks, assisting project managers in achieving their goals, but not influencing the management of projects; II) *Support Offices*, which determine factors to be followed and; III) *Strategic Offices*, which manage the corporate project portfolio (Anselmo & Maximiano, 2006).

It's even more emphasized, models that use the same classification parameter such as the following ones: i) from *the Project Repository*, which is focused on tools and data,

assuming the cohesive use of tools for project management and reporting; ii) *Project Training*, which performs all the functions of the first added model of providing tutoring, training and other assistance to project managers; iii) *Corporate*, which focuses on the supervision of the project portfolio and its alignment with the objectives and assets of the organization and is sponsored directly by top management (Kendall & Rollins, 2003).

Another recurrent classification made is by the degree of control and influence in the organization's projects. PMOs that have the lowest level of control are the ones of Support that have an advisory nature providing methods, best practices, the learned lessons, training, and the necessary information. Next, the type of the Control *PMOs*, which assist in support and require compliance through the adoption of methods, models and tools or governance. Lastly, respectively, one of the highest influence degree, the *Governing* PMOs that directly manage projects and take full control (PMI, 2013).

Another approach show us that: i) the Project *Support Office*, which aims to provide training services, awareness of the use of standards in the management and operations of projects within organization, managers and project collaborators during its implementations; ii) the *Project Control Office*, which is in charge of information management, gathering, preparing and providing information to assist in decision making, and, if necessary, suggest corrective measures; iii) the *Project Coordination Office*, which encompasses the evaluation, selection, and support of the projects, coordinating the departments involved and carrying out activities to improve collaboration among stakeholders (Aubry et al., 2012).

From this approach, were found sets of typologies divided by their authors, who in their theoretical research carried out the junction, classification, and naming of models, which in turn are differentiated by their specific characteristics. In Table 1, are summarized the authors, their typologies of PMO and a brief characterization of each one.

Table 1: Summary of the models analyzed

Author (Year)	Typology	Main characteristic
Maximiano and Anselmo (2006)	Project Control Office	Daily tasks
	Project Support Office	Determination of factors
	Strategic Project Office	Portfolio Management
Desouza and Evaristo (2006)	Administrative	Manage information
	Intensive knowledge	Performance Improvement
PMI (2013)	Support	Advisory nature
	Control	Requires compliance
	Directors	Direct Projects Management
Müller, Glückler and Aubry (2013)	Server	Operational support
	Controller	Control of defined metrics
	Partner	Exchange of knowledge
Englund, Graham and Dinsmore (2003)	Project assistance office	Plan and schedule activity
	Center of Excellence	Standardize processes
	Program Management Office	Authority on the projects
Kendall & Rollins (2003)	Repository	Focus on tools and data
	Training	Tutoring for Managers
	Corporate	Portfolio Supervision

Unger, Gemünden and Aubry (2012)	Project assistance office	Awareness of the use of standards
	Project control office	Assist in decision making
	Project coordination office	Project Management

Source: Prepared by the authors

Different academic contributions, referring to the typologies of PMO, were found in this review. However, the identified and mentioned models add a limited number of types, similar lines of reasoning and a great number of characteristics in common, since in the majority they aim to expose a conceptualization of theoretical models, of extreme value for a better basis in the theme, however still very superficial and generic. This entails the need to return to the literature to investigate case studies that describe models that are tailored to the emergence of real organizational variables.

2.2 Previous studies

In order to better propose a PMO model, this subsection reviews specific empirically validated models in real organizations, providing a more adequate overview of the variables that influence the definition of a PMO.

The first case study (Martins et al., 2005) is about a PMO implanted in a Mobile Operator of large national scope, born of the combination of two foreign groups. This junction led to the consolidation of its information systems, which in turn motivated the implementation of this PMO. The main difficulty encountered in the implantation was the resistance of the people due to the cultural change that the PMO represented. However, the PMO went beyond the frontiers of Information Technology (IT), considered a guarantee for success in projects. This structure was implemented with the initial objective of facilitating and conducting a change to the project management culture. For this, it was in charge of operational activities ensuring their acceptance, identifying best practices to develop, disseminate and implement methodologies, tools, and a database; as well as strategic alignment and anticipating possible challenges. Regarding the structure of the PMO, it should be noted that the project managers remained connected to their departments within the IT area (Martins et al., 2005).

The second study (Anselmo & Maximiano, 2006) was carried out in the world's leading telecommunication company. Its structure was receiving changes, going from departmentalized to partially projected, causing the implantation of a PMO. For this, planning was done, defining the objectives and preparing resources, treating as a project. From the outset, the researched PMO sought to exercise all of the planned functions, focused on mediation and guidance, even starting with a reduced number of projects. This structure has the responsibility of allocating project managers, providing support in the application of methodologies, processes, techniques, and tools for the analysis of reports. The implemented PMO reached its initial objectives, however, it was mediocre in its growth and maturation, obtaining as the greater difficulty the resistance to the changes occurred and as a critical factor of success the support of the top management (Anselmo & Maximiano, 2006).

The third study (Patah & Vimercati, 2016) was in a PMO implanted in a private HEI with more than one hundred thousand students in the undergraduate and postgraduate courses. This PMO is linked to the Postgraduate in Administration which for its creation adopted as inspiration the model of Project Management Center of Excellence aiming to develop and disseminate professional practices in project management, provide support to teaching and research related to develop and disseminate methodologies and tools, focusing on the development of skills and knowledge management. Through the application of training, the creation of performance indicators and monitoring systematics, development of IT tools, among other activities (Patah & Vimercati, 2016).

Table 2 presents a summary of the most relevant information for the continuation of the present study, containing the authors of the studies, a brief characterization of the studied organizations, the main data of the implemented PMOs and some relevant observations.

Table 2: Summary of the reviewed Cases

Author (Year)	Organization	PMO Characteristics	Comments
Martins *et al.* (2005)	Large mobile operator, resulting from the joining of two foreign companies.	Responsible for consolidating information systems and driving change to project management culture through operational activities.	The main difficulty was the resistance of the people; and the result is the PMO considered as a guarantee for success in projects
Maximiano e Anselmo (2006)	Telecommunications sector, which markets deployment projects.	Functions focused on the orientation of practices, methods, and tools, through analysis of reports produced by their project managers.	The initial objectives were achieved, but growth was mediocre; Achieving resistance to change as greater difficulty and support from top management as a critical success factor.
Vimercati e Patah (2016)	The Private University of the State of São Paulo, with more than 100 thousand students in 100 courses.	Aiming to disseminate professional practices in project management and assist teaching and research on the subject, providing methodologies, tools, and training.	Based on the theoretical model Center of Excellence in Project Management and linked to Post-Graduation in Administration

Source: Prepared by the authors

In these case studies is possible to find factors that repeat themselves or that present themselves from the relation with other factors, such as the fact that the PMO is always involved with some organizational change that can be cultural or even structural, or because they all cited the difficulty faced by people's resistance, as well as the need for top management support as a critical success factor. Another factor is the correlation presented between the organizational characteristics and the functions or responsibilities of the new structure. Several analyzes related to the implementation process of the Project Management Offices appear to contributes to this work. However, there is also a need to use the academic literature to verify the recurrence of the factors mentioned and the subject's state of the art.

3. METHODOLOGY

The research methodology that provided the achievement of the proposed objectives is entitled *Design Science Research*, which has the construction of knowledge for the design and development of artifacts (products, processes, models and methods) as its main mission (Van Aken, 2004), focusing on validating new projects to improve existing situations (Lacerda *et al*., 2013). This method is part of the science of artificial that is responsible for creating artifacts to obtain the desired characteristics and achieve the planned objectives. Artifacts, in its turn, are artificial objects characterized by objectives, functions, and adaptations (Simon, 1996). After this, it is possible to define its typology, that can be: Constructs, models, methods and/or instantiations (March & Smith, 1995). The knowledge developed is prescriptive and its training process is conducted by the following processes: awareness, suggestion, development, evaluation, and conclusion (Lacerda *et al*., 2013).

In Table 3 is presented how the work method was carried out, starting from the processes mentioned above, their respective descriptions, the way it was done to carry out the process and, finally, the result obtained.

Table 3: Work method

Process	Description	Context	Result
Awareness	Define the class of	Literature revision;	Existing PMO models and

	problems and the environment where it is inserted	Case study	an overview of UFB project management
Suggestion	Report of the conditions for creating the artifact and its implications	Analysis of the data generated by the previous process	Boundaries for artifact creation
Development	Report and justification of the characteristics and functions chosen	Creation of the proposed PMO model for UFB	Detailing the creation and artifact itself
Evaluation	Report of the tool chosen for the evaluation and its results	Evaluation of the specialists	Validation of the proposed artifact and finalization of the model
Conclusion	Review of processes and consolidations of knowledge acquired	Evaluation of previous processes.	Record of lessons learned and contributions of work.

Source: Prepared by the authors

3.1 Awareness

This stage refers to evidence of the class of problems, its external environment and its relationship with the problem, metrics and criteria for acceptance of the solution and those interested in it (Lacerda *et al.*, 2013), to do this a literature revision was made, and a search was conducted in the online databases: CAPES Journal Portal, Google Academic, and *ScienceDirect,* in November of 2017, using the keywords: "Project Management Office", "Implementation of an Office of Project Management", "PMO types", "PMO", "PMO *models*". The inclusion criteria used were: studies with titles directly related to the research topic and full text available. Regarding the exclusion criteria, studies that did not contain any relevant data related to the research were not included in the research.

In addition, to verify the reality of strategic projects management from UFB, a research was carried out with the descriptive objective.The method chosen for this was the case study, which is characterized by an exhaustive deepening of the research objects, providing a broad and meticulous knowledge of the researched reality (Yin, 2001; Gil, 2002). This method was chosen because of the research questions that are the "how" or "why" type, the researcher does not exercise control over the events that will be investigated (Yin, 1994).

In order to carry out the data collection and information, the documentary analysis techniques were used, which is the documents study, that is, source or knowledge base accessible for consultation (Pádua, 1997); and the questionnaire survey, which is a scientifically developed instrument, composed of a set of questions ordered according to a predetermined criterion (Lakatos & Marconi 1999).

For the construction of this instrument, the Prado's MPCM - Questionnaire for Maturity Assessment (2008) was used as the basis, since the proposed questions raise a similar overview to the intentions of our study. The data collection was done through an online form, sent by e-mail to the Pro-Rectory. In order to reveal possible drafting errors, a test with three university professors, who have the knowledge and the research experience in the administration necessary for this aid.

The data analysis was made from the descriptive statistics, which allows to characterize what is typical in a sample and verifies how the individuals are distributed in relation to certain variables (Gil, 2002).

3.2 Suggestion

In this second step, the aim was to specify the main requirements for the development of the artifact and the possible implications of the way it was characterized (Lacerda *et al.*, 2013), creating a basis to guide the next step. For this, a detailed analysis was performed on the data generated in the first step of this process, based on the abductive scientific method,

which studies the facts already reported in order to formulate hypotheses to explain them (Peirce, 1975), this same method gave to this studies the opportunity to relate the reality of the Brazilian Federal University (UFB) with the realities found in the academic literature, drawing parallels and finding interconnections.

3.3 Development

This step aims to elaborate the artifact creation process itself (Manson, 2006), describing the functions and characteristics of the artifact, together with the justifications of their choices and their causal relationships necessary for the artifact to achieve its objectives (Lacerda *et al.*, 2013). Among the types of existing artifacts, it is understood that the most adequate for the work referent is the model, which is a description of a set of variables that relate to each other and represent a certain reality (March & Smith, 1995).

The proposed characterization of the Project Management Office model for the Brazilian Federal University (UFB) was composed based on the examples studied by the literature review, the features identified in UFB by case study and will primarily be based on the analysis of the previous step (Suggestion). With this, a list of constructs was generated, together with their definitions and relations, defined from the researcher's perception.

3.4 Evaluation

In this step, the evaluation process of the developed model will be detailed, describing the chosen mechanism, how it was performed and the result achieved (Manson, 2006). This rigorous process of verification of the quality of the artifact in relation to the solutions proposed in the environment for which it was developed is a very important stage for the construction of knowledge in Design Science Research since it aims to validate the proposed model. Regarding the criteria for validation of the artifact, because they are pragmatic (Romme, 2003), rigor in the design and conduct of the research does not guarantee the validity of the artifact, since the main criterion in this philosophy is the efficacy and effectiveness of the solution to the problem was proposed (Van Aken, 2011).

The constituent elements of the model will be reviewed by a group of experts at different times. This mechanism will be used to obtain the participants' understanding of the topic of research interest, allowing everyone to express their opinions freely, without external pressures of time or even business policies.

3.5 Conclusion

Finally, we synthesize the lessons learned and the contributions of the work to its class of problems (Lacerda *et al.*, 2013). This stage of the research was the point of reflection and formalization of the results generated, of the deviations occurred when compared with the proposed goals, aiming to generate contributions regarding the lessons learned, interconnections emerged, among several other possible contributions. For this purpose, a written report was made of the most important factors found in the study, in order to synthesize the results obtained. The main lessons learned from the process of model construction were recorded as well, being defined from the researcher's perception.

4. RESULTS AND DISCUSSIONS

In this section we will discuss the execution of the four initial stages of the chosen research methodology: i) Awareness; ii) Suggestion; iii) Development; iv) Evaluation.

4.1 Awareness

To conclude this step a case study was carried out, where the object of analysis was the strategic projects management of UFB's. With this, first, a documentary analysis was carried out in the Institutional Pedagogical Project (IPP) 2011/2022 and in the Institutional Development Plan (IDP) 2015/2018 because in them are the principles that give coherence and direct any action carried out by UFB, as well as Grant's definition of strategy (1998).

In this preliminary study, it was identified that the UFB in its fields of action, aims to "train professionals prepared to contribute to human development and the improvement of

socio-environmental quality, as well as to provide advances in knowledge and education full of excellence" (UFB, 2011). Turning its attention to the coastal and oceanic ecosystems, seeking to consolidate itself as a national and international reference in education and technological development in this vocation (UFB, 2011).

Assuming the aforementioned scenario, the university builds its strategic objectives, which in turn base the goals and strategies of the so-called "guiding axes" of the UFB, which are its twelve areas of focus. The feasibility of these objectives and strategies occurs through the projects managed by the Pro-Rectory. For this reason, a research instrument was designed to map the management process of these strategic projects. For better understanding, the instrument was divided into five parts: i) training; ii) knowledge level; iii) continuous improvement iv) project coordination; v) performed processes, contemplating the various levels of maturity in project management. Within each part, affirmations were placed representing an ideal situation, each Pro-Rector being invited to relate his reality to the statement, quoted above, choosing between 1 (totally disagree) to 5 (totally agree).

This allowed us to verify several important indicators, such as the situation of each department, the joint situation of all, the difference between the reality of each sector and, finally, also provided a way to identify the strengths and weaknesses in order to show the class of problems; its external environment and its relation to the problem; metrics and criteria for acceptance of the solution; and stakeholders (Lacerda *et al*., 2013).

Table 4 shows the answers obtained in the instrument, presenting the statements (summarized) and the level of conformity of the reality of each Pro-Rectory.

Table 4: Summary of the obtained responses

Affirmations	PR1	PR2	PR3	PR4	PR5	PR6	PR7
In regards to the topic "Training"							
UFB encourages external trainings	5	4	5	4	5	4	5
The UFB conducts GP trainings	3	4	3	2	4	2	4
The UFB capacitates in software that helps the GP	2	3	2	2	3	2	3
The head of the sector has training on the PMBOK	1	3	2	1	3	2	4
The team has training on the PMBOK	1	2	2	2	3	1	3
In relation to the knowledge level							
The sector knows about specific issues	5	4	3	4	5	4	5
They know the importance of organizational structures	5	4	4	2	3	2	5
The head of the sector knows about GP	3	4	3	3	3	4	5
The leadership of the sector stimulates the use of this knowledge	3	4	3	3	3	3	5
The industry team knows about GP	4	3	3	4	3	4	5
Regarding the theme "Continuous Improvement"							
There is a formal continuous improvement system	2	4	2	2	3	4	5
There is a database with a history	2	4	3	1	2	2	5
This database is in use by all	1	3	3	1	3	2	5
The main causes of failures were identified	1	3	4	2	3	2	5
There are countermeasures implanted for these causes	1	3	4	2	4	2	4
In relation to the coordination of projects							
The UFB has a program that defines processes	1	4	3	2	4	3	5
There is a GP methodology	1	3	4	1	3	2	5
The use of this methodology is routine	1	3	4	1	3	2	5
There is an evaluation system of the sector team	1	3	4	1	1	2	4
In relation to the performed processes							
The processes were mapped and standardized	4	4	4	2	3	3	4
The material is available to all	3	4	4	2	3	3	3
There is a planning of new projects	1	3	4	2	3	3	5
There are criteria for strategic alignment	1	4	4	1	3	3	5
There are project evaluation meetings	1	3	4	1	1	2	5

There is a follow up of the execution	3	3	5	3	3	3	5
In the case of deviations, there are countermeasures	1	3	5	2	3	3	5
In the case of anomalies, there is a process of	1	3	4	1	1	3	4

Source: Prepared by the authors

However, when asked about "Training", it was identified that the UFB strongly encourages its employees to seek external training (such as training courses, master's degree, MBA, certification, etc.), but what is no longer the same proportions when the organization is responsible for providing training on project management in a more general way, reducing, even more, the perception when it comes to training on more specific topics, such as "project management assistance software". It was still questioned about the training offered in relation to the knowledge offered by the PMBOK, however, even with the division between the head of the sector and the operational team, the level of training falls to the point of being considered that they have nothing of training in this subject.

Afterward, when asked about the level of knowledge, the research revealed that the employees know enough about the specific subjects of the sector, as well as the importance of organizational structures, such as Project Management Offices, to assist in the management of projects. At the level of knowledge and acceptance of the subject "Project Management" under the perspectives of the top management of the sector versus the team of the sector and its stimulus relation, it is noticed that there has been a decrease, but there is some understanding and encouragement, even if medium.

In the part of the level of the practices aiming at the continuous improvement found great differences between some Pro-Rectory that perceive to exist some type of system of evaluation of the processes with similarities to the mentioned ideal and others put away from this situation. Two aspects were considered essential for a system of continuous improvement: the existence and use of a database with the most relevant information of the projects already closed; and identification of the main causes of failure already occurring in projects and their countermeasures. In these aspects, one can find a pattern in the answers obtained, where the same sectors that already showed fragility in the first affirmation presented the same fragility in the other requirements analyzed.

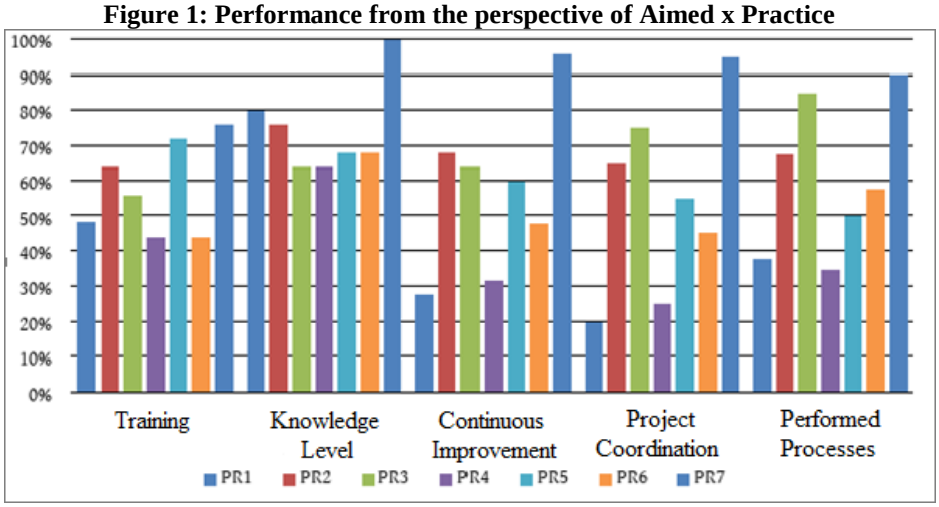
It was also analyzed the reality of the coordination of the projects, seen from three perspectives: the influence and control of the UFB under the projects; the existence and use of a pre-defined work methodology; and the existence of an evaluation system for project collaborators. In them, there was a variation in the perception of the Pro-Rectory, because when asked about the existence of a program of definitions of techniques, tools and methods by the UFB some responded that there is nothing and others said that there is something similar to the characteristics cited above. This difference remains almost in the same proportion until the end of this class.

Ascertaining the reality of the processes carried out we inquired about the existence of mapping and standardization of the processes performed in the sector is for a pleasant suppressed the responses received signaled something similar to what is presented above, but still is not something that is available to all those who are involved with industry projects. In the same line of reasoning, and based on the ideas of the group of project management processes (PMI, 2013), again, a great variation was noticed, since some sectors do not have the practices reported in the statements, and if they have, they are very discrete, however other sectors perceive the strong presence of these practices mentioned above. It is worth mentioning that the process of monitoring the implementation of projects is an exception to the aforementioned scenario, since, even if not ideally, it is present in every Pro-Rectory.

Figure 1 presents the performance of the Pro-Rectory from the perspective of "Real" versus "Ideal", to get there, we calculated the sum of the perceived level of conformity of

each sector in each group of affirmations dividing by the sum of the maximum of conformity with ideal situations, which multiplied by 100 resulted in the percentage of performance.

Figure 1: Performance from the perspective of Aimed x Practice



Source: Research Data

In general, the UFB presents initiatives in training, mainly stimulating its employees to seek training externally, and, even if perceived as far from ideal, there is a movement aiming at a better qualification in project management. Another factor that drew attention was that, despite a consensus among the Pro-Rectory in the first statement, there is a big difference in the realities of each sector. Already at the level of knowledge, the overall performance of the organization, such as that of each department in this respect, was very satisfactory, following a pattern among the Pro-Rectors approaching more than the ideal understood than the previous criterion, with few variations between the answers and presenting the existence of important knowledge for our study.

In the theme Continuous Improvement, the organization showed difficulties comparing to the ideal level, mainly due to the situation of some of its Pro-Rectory, which performed at times almost nonexistent. Another reality that caught the attention was an oscillation that occurred within the responses of the same sector. However, checking the question of coordination of projects, it is possible to see a repetition of scenario with the previous one obtaining some Pro-Rectory with a level closer to the ideal and others are perceived far from this reality. In the processes carried out, it can be seen that the reality of UFB in this issue is relevant, although there is still a considerable margin to be worked and improved, although it is satisfactory to see that this improvement can come from the use of good practices carried out within the organization.

This process of bibliographic review and case study was carried out to become aware of the class of problems to be addressed by the artifact. After analyzing the data mentioned so far, it is understood that the main components of the class of problems are:

i) the great variation of performance among the Pro-Rectory, identified on several occasions of our research, in particular in the practices of continuous improvements and in the coordination of the projects;
ii) the absence of the provision of training in themes that help in the management of projects such as the aforementioned "software" or the areas of knowledge of the PMBOK, identified as a fragility in the study;
iii) The lack of a unified database among Pro-Rectory and that is available to all those involved with projects, containing a history of projects already closed with their indicators, their failures, their countermeasures, and other pertinent information;

iv) the lack of continuous evaluation of project management practices aimed at improvement, also identified as difficulty in some sectors;
v) the absence of a standard formal guide for any university of process definition that is available to all involved with projects;
vi) the difficulty of having an evaluation system for project team members;
vii) the level of importance and complexity of strategic projects;
viii) the initial absence of support from UFB's top management, since this work did not arise from a need demonstrated by this circle of people who run the university's course;
ix) the resistance of people to change, cited by all the cases found as the greatest challenge, because they have their ways of working with projects.

Another objective is to become aware of the external environment and its relation to the problems encountered. In this context, it was defined that this environment is composed of a public university owned by the federal government and that plans to achieve excellence in education and the construction of knowledge and technologies mainly related to coastal and oceanic ecosystems, aiming to be recognized even in the International scope. However, this depends directly on the management of your Pro-Rectory projects.

The PMO characterization will only be accepted as a solution to the class of problems mentioned above if the characteristics that will be proposed:

i) should correspond to the items mentioned in the class of problems;
ii) cannot go against those already studied in the bibliographic review;
iii) should be in accordance with UFB's strategic alignment;
iv) should rise innovative solutions;
v) be in accordance with the current reality of in terms of solutions and resources.

These criteria can be verified against the following metrics:

i) level of understanding and consistency with the class of problems;
ii) level of understanding and coherence with the theoretical framework;
iii) level of understanding and coherence with the reality of UFB;
iv) possibility of implementation;
v) ability to deliver benefits after implementation.

4.2 Suggestion

This step will specify the main requirements for the characterization of the PMO and its possible implications so that it will be characterized. With this, the main requirements are:

i) This requirement is necessary because, with a universe of possibilities as immense as that of a university of the size of the UFB, if PMO does not have a clearly stated focus the loss is certain;
ii) To be a formal unit, all the definitions found in the literature and described here primarily characterized a PMO as a formalized structure, it is this fact that gives the prestige necessary to carry out the planned work;
iii) the support of the *stakeholders* since it can only help /manage whoever wants to be aided/managed, as well as the greatest difficulty is the resistance of the people to the changes occurred and the biggest critical success factor the support of the top management (Anselmo & Maximiano, 2006);
iv) To be a center of exchange of information, because as identified in our work one of the greatest weaknesses is the disparity of the level of maturity and the processes carried out between the Pro-Rectory;
v) be a body that generates knowledge, to meet the needs found in our study of being a provider of training and to provide a system of continuous improvement.

vi) to promote the use of techniques, tools, methods, methodologies, metrics, standards, as it is the function of a PMO, giving the professionalization of practices to guarantee the success of projects.

The fulfillment of these requirements, assuming that the characterization of this PMO will be implemented under the same research conditions, could result in several quantitative benefits for the university, such as financial, time, effort, quality, technological advances, even other qualitative indicators such as increased knowledge, improved organizational climate, or improved university reputation, however, the unsuccessful realization of this proposal could burn future proposals that could come, and that it would be immediately linked to the bad reputation of this enterprise, even if without any connection, as well as obviously the reversal of the same benefits cited in wrongs.

4.3 Development

In order to better present this section, since its objective is to elaborate the artifact creation process itself (Manson, 2006), which in this case is the PMO characterization proposal, it was divided into five parts: mission; view; philosophy of action; main functions and duties; internal organization. Before we start, it is worth to notice that this proposal was built based on the PMO models that are based on the studies of Martins *et al.* (2005); Maximiano and Anselmo (2006); and Vimercati and Patah (2016).

4.3.1 Mission

The mission is to: assist UFB in the management of its strategic projects and promote advances in knowledge and in the construction of improvements in the management of strategic projects. Understanding the current reality of the UFB before the proposal, it was understood that this mission can be justified by the initial absence of the support of UFB's top management, which leads to propose the PMO as a means to support decision making, besides aiming at an alignment with the university strategy was resolved prioritizing the promotion of advances in knowledge and the construction of improvements.

4.3.2 View

To be a center of excellence in assisting the management of strategic projects of UFB, consolidating itself as a guarantee of success in projects and making the university a reference in project management.

Thinking about where the objective is supposed to go, considering the coherence with reality versus the intention of promoting sustainable growth and recognition in the university's fields of action, it was understood that this view is justified as UFB's portfolio of strategic projects presents a great complexity and importance that needs to search for the guarantee of success and for a support of excellence.

4.3.3 Philosophy of Action

The UFB's PMO will be a formal structure with the purpose of providing services that support the Pro-Rectory in the management of their projects, not having authority over the projects, only performing functions of mediation and orientation, as well as acting in the knowledge promotion and information management.

Realizing the great challenge of overcoming the resistance to change of people, reported in the literature, it was decided that the practice of the proposal would follow the ideas of Martins *et al.* (Aubry & Gemünden, 2012), which overcame this challenge by focusing its PMO on operational activities, guaranteeing its acceptance. To base this performance philosophy, the characteristics of PMO's models of project *support and control* (Aubry et al., 2012); the *supporting* PMO (PMI, 2013); the *partner* PMO (Aubry et al., 2013); and the PMO *of intensive knowledge* (Desouza & Evaristo, 2006) were used. They envision the functions of an Office under different perspectives, but that for the proposal are complemented by expanding the scope of attributions and answering the class of problems.

4.3.4 Main Functions and Duties

In this part will be detailed which attributions of the theoretical models mentioned above that will be used, among others created to supply the particular reality of this study, as the motivation of these being those chosen to be part. The functions understood as ideas:

i) it shall be responsible for creating and maintaining a communication plan for the exchange of knowledge based on the reciprocal relationship between the parties concerned. With this, it will be possible to try to combat the variation of performance described as difficulty and still provide a continuous supply of information to the PMO;
ii) will be responsible for providing training services focused on techniques, methods, tools, among other similar topics; increasing the intensity of internal capacities in project management;
iii) it will be responsible for creating and maintaining a database, managing the information, gathering them, preparing them and providing them to better assist in the decision-making of the Pro-Rectory. With this, it can help in the problem of not having a database available for all involved in projects;
iv) will be responsible for creating and maintaining a program focused on developing and expanding performance improvement, through process evaluation, search for best practices, increased maturity, learning from successes and failures; aiming at solving the problem of not having a permanent evaluation that aims at continuous improvement;
v) will have the function of providing internal consultancy, when required, providing methods, best practices, tools, techniques for managing strategic projects; meeting the requirement that suggests promotion of these factors mentioned above;
vi) It will be responsible for creating and managing a manual of good practices in the management of strategic projects; meeting the requirement that suggests the creation of a formal guide to process standardization;
vii) create an evaluation tool for the main indicators, mainly to evaluate the performance of the human resource, which has been shown to be fragile in the study;
viii) The last and most important function will support teaching and research for topics related to the management of strategic projects, aiming to stimulate research, development, and innovation in the area. This assignment will provide or support the fulfillment of all other functions.

4.3.5 Internal Organization

This proposal of characterization of a PMO to assist strategic projects of the UFB will be, in the hypothesis of being implemented, organized like an Extension Project, since as a criterion of acceptance of the characterization it is necessary that it becomes a formal unit. However, it will be registered in the area of "Technology and production" of academic nature for its "indissociability between teaching, research and extension, especially with impact on student training and the generation of new knowledge and its interdisciplinarity" (UFB, 2012).

The team needed to start the project would be a teacher or administrative technician who assumes the role of coordinator and be responsible. The necessary infrastructure would be only one place for the meetings, computers for the accomplishment of the attributions mentioned above.

5. FINAL CONSIDERATIONS

The process of evaluation and validation of the proposal of characterization of a PMO was carried out continuously throughout the process of awareness, suggestion, and development. Among the contributions, the following stand out: i) the organization of the PMO as an extension project; ii) add to the assignment to provide methods, tools, and metrics; iii) add to the philosophy of action the promotion of knowledge.

After the end of this stage, the proposal was submitted to evaluation and validation to two experts in the area of administration by email, so that their validations are not affected by the author's vision or by the time pressure. The artifact was validated under some conditions to be modified in the development, among them the most relevant are: i) add the necessary infrastructure for the realization of PMO characterization proposal; ii) add to the justification of the mission of the PMO proposal its relation with the UFB's strategic alignment. This step was complete with the changes made according to the suggestions made by the experts' group.

Finally, the study aimed to propose an alternative that could assist in the management of the UFB's strategic projects, for which the PMO proposal was based. Focused on this idea, we tried to answer what would be the best characterization of this tool for UFB. In order to achieve this response, it was necessary to investigate in more detail the two main variables of this question, PMO and UFB, this allowed to know a multitude of possibilities of models of proposed Offices with similar characteristics and the purpose a common purpose: to assist the organization in achieving their goals. The other variable was a university focused on generating knowledge, innovation, and technologies aimed at coastal and oceanic ecosystems, seeking excellence in public education and recognition of this quality. To this end, we found a giant structure focused on the realization of projects with the realization of several practices that we understood as ideal.

However, the construction of the best proposal of characterization of a PMO for the strategic projects of the UFB provided great learning by its high level of complexity and responsibility between them it is possible to stand out: i) the need to manage research time well; ii) conduct more detailed research on the UFB, covering beyond what is published in formal documents; iii) conduct qualitative research with the Pro-Rectory, seeking to absorb the maximum information and data with the experience and knowledge of those who work day-to-day with projects; iv) obtain a good command of the English language, for a better understanding of the most qualified academic productions in the subject; v) know the research method in detail and; vi) have a wider scope of practical PMO implementation cases.

Overcoming all these challenges, the research made possible several contributions that can bring benefits to the university. These contributions stand out: the ability to maximize the resources needed for the UFB; the capacity to generate knowledge in this area making possible great advances for the management of the university's strategic projects; the ability to generate tools that support decision making; the ability to provide support in processes increasing the success rate in projects.

However, it is worth emphasizing that this research is far from encompassing the entire spectrum of possibilities for this theme, characterizing as an initial proposal. But it is clear the opportunity to continue with this initiative, mainly by deepening the research on the reality of the management of strategic projects of UFB or how would be the best processes of implementation of PMO, among other aspects that deserve to be expanded.

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