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ENTREPRENEURIAL ORIENTATION: EVIDENCE OF ITS MANIFESTATION IN FOUR PROJECT MANAGEMENT OFFICES

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ABSTRACT

This study aims to analyze how entrepreneurial orientation dimensions manifest in different types of project management offices in companies that develop software, from the perspective of their project management systems. The research method used was a multiple case study in four software development companies. Data collection strategy included semi-structured interviews, document analysis and filed records. Data were triangulated and analyzed inter- and intra-case. The results obtained indicated that dimensions of entrepreneurial orientation can manifest at different levels in the same type of project management office. Factors related to the organizational structure and the management system adopted tend to affect the way in which entrepreneurial orientation manifests in a determined context. The main limitations are methodological and refer to the holding of one interview per company and to the way the analysis was conducted, since another researcher could adopt another form of analyzing data and presenting results. This study allows for understanding of the entrepreneurial orientation phenomenon in a project management context in addition to proposing future studies on this theme based on the gaps identified.

Keywords. Entrepreneurial Orientation (EO); Entrepreneurial Orientation Dimensions; Project Management Office (PMO); Project Management Systems (PMS); Multiple case study.

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1. INTRODUCTION

For a little over three decades, researchers into entrepreneurship have been using the concept of Entrepreneurial Orientation (EO) to differentiate between entrepreneurial and conservative companies. However, there remain several ontological questions on this theme, despite the growing academic interest in studies of EO (Anderson, Kreiser, Kuratko, Hornsby, & Eshima, 2015). Debates on the dimensions of EO (Miller, 1983; Lumpkin & Dess, 1996), about whether there is a variation among them (Lumpkin & Dess, 2001) and whether the concept is being used appropriately (George & Marino, 2011) are constant in studies on EO. In this article, we adopt the multi-dimensional view proposed by Lumpkin & Dess (1996), in which EO exists as a set of five independent dimensions: innovativeness, risk-taking, proactiveness, autonomy and competitive aggressiveness.

Project management (PM) is another theme in vogue in the academic field, with project management offices (PMO) and project management systems (PMS) among its sub-themes. Some authors consider that PMOs can be configured in different types depending on their characteristics and on the projects carried out and on the existing organizational structure. The typology proposed by Dinsmore (1998), adopted in this study comprises five types of PMO: autonomous project teams; project support office; PM center of excellence; program management office and chief PMO.

PMSs include structures regarding management, norms and procedures (Cooke-Davis, Crawford, & Lechler, 2009) in which PM and its PMOs are embedded. Such systems provide flexibility in planning, better communication and control of activities developed and greater success in carrying out innovation projects (Kapsali, 2011). Projects and programs need to be aligned to organizational strategy (Dinsmore & Rocha, 2014) in order to need to define and systematize structures, norms and procedures (Cooke-Davis, Crawford & Lechler, 2009).

Since EO can be revealed throughout the company at any time and in different ways over time depending on the entrepreneurial actions and behavior adopted (Wales, Monsen, & McKelvie, 2011), this article seeks to analyze how the dimensions of EO manifest in different types of PMOs in software development companies, from the perspective of their PMSs. Thus, the following question arises: *How do the*

dimensions of entrepreneurial orientation manifest in different types of project management offices from the perspective of their project management systems?

A multiple case study was chosen as the research strategy. Four PMOs in software development companies were investigated. Data were collected from the PMO managers by means of semi-structured interviews composed of open-ended questions; analysis of documents; and filed records. Inter- and intra- case analyses were carried out to evaluate the data obtained after triangulation of the multiple sources of evidence.

The results allowed us to confirm that EO dimensions manifest in different ways in different PMOs. One piece of evidence found points to the existence of two types of PMOs with EO dimensions manifested at different levels, though the PMOs presenting the same organizational structure. Other evidence signals the fact that competitive aggressiveness did not manifest in the PMOs analyzed, while proactiveness and innovativeness were more evident in these offices.

Regarding academic contributions, analyzing the presence of EO in a differentiated context but centered on PMOs, adds to the literature. In addition, new study possibilities were generated from this research, given that EO and PMO themes have been little explored together. As a practical contribution, this study allows PMOs to come to use EO practices to carry out their activities.

2. ENTREPRENEURIAL ORIENTATION IN PROJECT MANAGEMENT OFFICES

This section presents the theoretical basis of the study, including the concept model.

2.1. Entrepreneurial Orientation and its Dimensions

Approximately thirty years ago, EO emerged as one of the constructs studied in the field of entrepreneurship (Martens, Lacerda, Belfort, & Freitas, 2016). Treated as an entrepreneurial position (Covin & Slevin, 1991), EO is defined from the adoption of behaviors related to the search for innovation, proactive performance and risk-taking (Miller, 1983; Covin & Slevin, 1989). This study adopts the definition given by Covin, Green and Slevin (2006, p. 57), for whom EO is a “strategic construct whose

conceptual domain includes certain firm-level outcomes and management-related preferences, beliefs, and behaviors as expressed among a firm's top-level managers".

Corporate strategy is reflected in the actions and behavior of a company's managers and consequently in its EO. The strategies adopted by the manager reflect the willingness of the organization to engage in entrepreneurial behavior (Wiklund, 1999). The multi-dimensional approach (Lumpkin & Dess, 1996) argues that EO is characterized by behaviors that relate to the manifestation of the dimensions innovativeness, risk-taking, proactiveness, autonomy and competitive aggressiveness. Some of the actions that characterize these dimensions in the organizational sphere are (Freitas, Martens, Boissin, & Behr, 2012; Belfort, Martens, & Freitas, 2015):

- **Innovativeness** – the creation of new products and services; innovation in organizational and administrative processes; employees dedicated to the carrying out of innovations; the capture of external resources to invest in innovations.
- **Risk-taking** – engagement in high-risk projects; a non-conservative vision when taking decisions; the exploitation of potential opportunities; bold action in the attempt to deal with organizational objectives; the taking of personal, financial and entrepreneurial risks.
- **Proactiveness** – anticipating a competitor's actions; monitoring of the internal and external environment; searching for new opportunities; being ahead of the competition in the introduction of new ideas and products.
- **Competitive aggressiveness** – reactive action to the acts of competitors; adoption of unconventional positions, often eliminating the competition; the adoption of unfair practices to compete financially, for example prices lower than those of the competition.
- **Autonomy** – the creation of a favorable environment so that individuals and teams can act independently and autonomously, including decision making; supplying the means that enable employees to identify and select new business opportunities.

The actions taken by the company will delineate the manifestation of each of the EO dimensions and will shape its strategy. However, such dimensions do not necessarily manifest simultaneously (George & Marino, 2011). It is possible for two companies in the same area to manifest different dimensions, and different levels of

manifestation. Thus, considering that the manifestation of EO can occur at different times and that EO is analyzed in the specific context of PMOs in this study, the next section is dedicated to this theme.

2.2. TYPOLOGY OF PROJECT MANAGEMENT OFFICES

The increasing concern shown by companies in implementing PMOs tends to be associated with such factors as the search for an increase in project success rates, which still remain low (Richer, Marchionni, Lavoie-Tremblay, & Aubry, 2013), and the visibility of activities related to projects (Aubry, Hobbs, & Thuiller, 2008). Defined as units whose objectives include the creation and availability of solutions that make excellent project management possible in a company (Mariusz, 2014), as well as better project success rates (Richer, Marchionni, Lavoie-Tremblay, & Aubry, 2013), PMOs can be configured in different ways, depending on the projects being carried out or the structure of the organization.

Although several studies deal with types of PMOs, in this article we have opted for the typology proposed by Dinsmore (1998). In Table 1, the main characteristics of each PMO type are presented, which are as follows: Autonomous Project Team – APT), Project Support Office – PSO, Project Management Center of Excellence – PMCOE, Program Management Office – PrgMO) and Chief Project Office – CPO.

Table 1. PMO typology – Characteristic elements

	Function	Decision process	Specifics
APT	Integral project management	Integral participation	Autonomous project. PM located inside the project itself. No support from the organization
PSO	Technical and administrative support given to project managers, helping with planning, programming and control of changes in the project.	In accordance with the responsibility it exercises on the information related to projects.	Resources are allocated to projects, depending on their nature and contractual structure. Members can be on loan at the beginning of or during the project.
PMCOE	Dissemination of PM knowledge and methodologies.	Does not participate	Nucleus of experience in projects, in charge of convincing everyone of the usefulness of PM methodologies. Expenses are not allocated directly to the project.
PrgMO	Project manager management. Includes functions of PMCOE and, in some cases, PSO	In the program sphere and decisions related to the project portfolio.	Coordinates project managers. Efforts concentrated on priority projects.
CPO	Expansion of the project portfolio.	In questions of a strategic nature.	Broadens project vision to all areas of the organization, connecting them to the company's strategies.

Source: Devised by the authors, based on Dinsmore (1998)

Two factors contributed to this article's adoption of the typology proposed by Dinsmore (1998): (i) the possibility of the reconfiguration of a PMO in view of the organizational environment into which it is inserted (Dinsmore, 1998); and, (ii) the possibility of the manifestation of EO dimensions at different levels depending on the context into which it is inserted.

2.3. Project Management Systems and the Cooke-Davies, Crawford & Lechler (2009) PMS Strategic Model.

Alignment between PM and the strategic objectives of the company is fundamental to the implementation of a structure of corporate governance and to the

internal aspects of PM (Too & Weaver, 2013). Corporate governance in projects, with well-defined structures, norms and procedures, allows for strategic alignment between projects and programs carried out by the company and its strategy (Dinsmore & Rocha, 2014). The adoption of a systematic approach and of corporative governance enables such projects and programs to be in accordance with company strategy.

Projects are run inside PMSs, systems that involve management, norms and procedures structures (Cooke-Davis, Crawford, & Lechler, 2009). Systemization and balance between the project portfolio management, the PMOs and projects and programs are fundamental the lack of a systematic vision on the part of those involved in the process, and including the of corporate governance (Too & Weaver, 2013). These are key elements of corporate governance and can be obtained through the implementation of PMSs.

In adopting a systematic approach in PM, the company is compelled to make decisions that can contribute to the success of projects carried out (Kerzner, 2006). The implementation of PMSs promotes greater flexibility in planning, communication and control of the activities that are reflected in the success of the carrying out of innovation projects (Kapsali, 2011). Choosing an appropriate PMS that serves the company's purposes is the main challenge in this context.

The study by Cooke-Davis, Crawford & Lechler (2009, p. 111) arose with the aim of identifying "how the configuration of a PMS should fit the strategic requirements that an organization is imposing". The development of new products, entrepreneurship/ intrapreneurship and PM (lines of research independent in themselves, but liable to correlation), possibly affect and are affected by corporative strategy, in different contexts and by different strategic drivers. Defining and systematizing structures, norms and procedures enable conciliation between strategy, corporate governance and PM.

From the association of these three aspects – development of new products, entrepreneurship/intrapreneurship and PM – to the advantages of differentiation and efficiency in economy of processes proposed by Porter, the authors Cooke-Davis, Crawford & Lechler (2009) devised the Strategic PMS – Value Driver Portfolio Model (Figure 1).

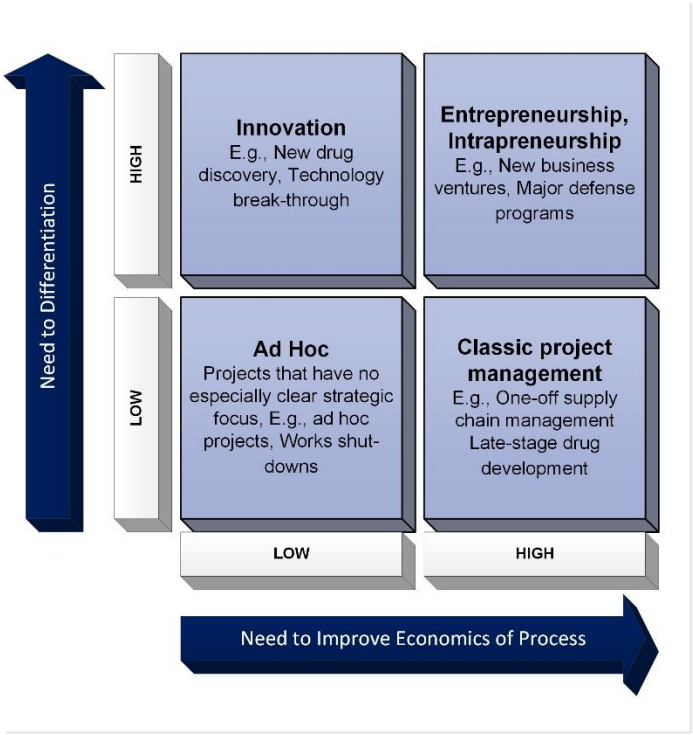

Figure 1. Strategic PMS – Value Driver Portfolio Model

Source: Devised by the authors, based on Cooke-Davis, Crawford & Lechler (2009).

The model aims to relate particular types of projects to determined strategic value drivers for a specific strategy. Each scenario presented defines a singular series of factors for the implementation of a PMS and each of these requirements necessary for PM should be in harmony with organizational strategy (Cooke-Davis, Crawford, & Lechler, 2009).

In the case of the ***Ad hoc*** system, companies are basically operational, with actions focused on the continuity of business, justifying the non-existence of a strong PMS. The **Classic PM** system predominates in large engineering companies that deal with complex projects and require a process of radical learning, given the need for a highly efficient PMS. The **Innovation** system is the trend in companies that strive for strategic differentiation through constant innovation of products and services, and a high level of creativity. Such companies need a PMS with projects focused on creating new markets and satisfying those already existing. As for the **Entrepreneurship/Intrapreneurship** system, it is common to find this in companies that seek excellence in leadership and a high level of entrepreneurial autonomy, in which both entrepreneurial and intrapreneurial behavior should be developed simultaneously. There is a search for balance between economic results and the need

for creativity and innovation. The PMS in this scenario presents a high level of complexity, though there is still a need for research (Cooke-Davis, Crawford, & Lechler, 2009).

2.4. Synthesis of literature and the Study Concept Model

As the PMS involves corporate governance, which sees a key element to its success in the PMO, and since EO can manifest in PMOs, we propose a study of the three theoretical axes together. The concept model emerges with the aim of enabling greater understanding around the relation between the dimensions of EO and the types PMOs from the perspective of the Strategic PMS Model, (Figure 2).

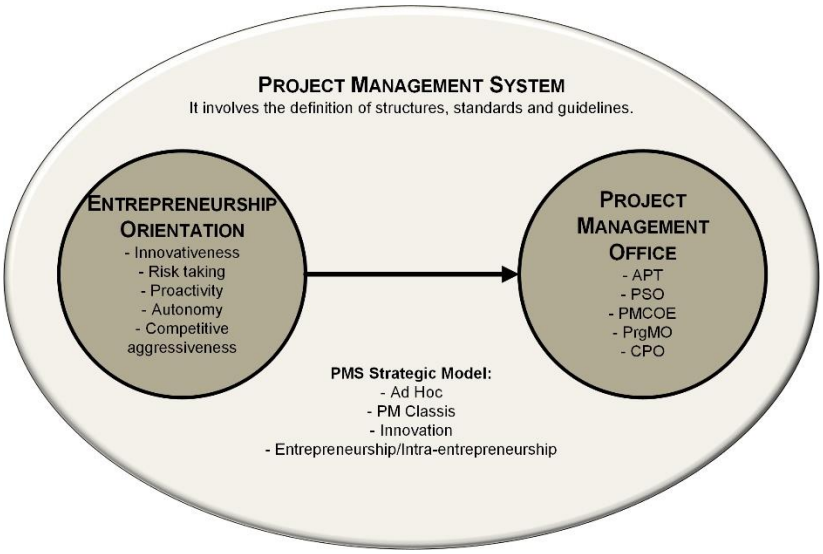

Figure 2. Study concept model
Source: Devised by the authors

Both the manifestation of the dimensions of EO and the type of PMO implemented by the company depend on decisions of a strategic nature and the relation with organizational structures, norms and directives. Such elements make up what is called, in PM, PMSs. In Figure 2, there was an attempt to represent this relation by including the theoretical axes of EO and PMO inside the PMS. The arrow that links EO to PMO aims to represent the manifestation of the EO dimensions in the types of PMOs existing in the company.

Table 2 is presented to clarify the theoretical base in relation to the main authors and aspects considered. In addition, some reflections regarding the three theoretical axes are presented.

Table 2. Conceptual approximation and initial relations between the theoretical pillars

Theoretical Pillars	Theoretical base	Some initial reflections on the analysis of the relation between the themes of PMO and EO
PMS	Strategic PMS Model proposed by Cooke-Davis, Crawford & Lechler (2009)	The PMS tends to present different manifestations of EO, depending on the system adopted and in which quadrant it is found. The systems classified as Entrepreneurship/Intrapreneurship tend to possess the five EO dimensions, given their entrepreneurial characteristics.
PMO	PMO typology proposed by Dinsmore (1998)	Depending on the type of projects existing in the organization, the appearance of different EO dimensions can occur. For example: the APT type tends to act autonomously, while PrgMO can present the proactiveness EO dimension, given its characteristics.
EO	EO dimensions proposed by Lumpkin and Dess (1996) EO elements in software organizations proposed by Freitas et al. (2012)	Since the PMO can be an organism apart or integrated into the organization, it can present the characteristic elements of EO (Figure 5). It is possible for the EO dimensions to manifest in different ways in the PMOs, depending on the typology adopted and the strategy of the organization.

Source: Devised by the authors

These initial reflections allow for the identification of a relation between the themes of EO and PMOs. Similarly, it is possible to analyze the EO in PMOs considering the Strategic PMS Model proposed by Cooke-Davis, Crawford & Lechler (2009), for once the systems adopted by the organizations are identified, they can be allocated in one of the scenarios of the model. It is also possible to infer that a given system tends to possess a determined type of PMO and this tends to present the manifestation of one or more EO dimensions.

With the objective of identifying the manifestation of EO dimensions in PMOs, the characteristic elements of each dimension identified in the software companies by Freitas, Martens, Boissin and Behr (2012) are adopted. Considering that the

manifestation of EO can occur at any time, such elements were adapted for application in the context of PMO, with the aim of responding to the question guiding this study: *How do the dimensions of EO manifest in different types of project management offices from the perspective of their project management systems?*

In the section devoted to the analysis and discussion of results, we will take this subject up again.

3. METHOD

This research takes an explorative and qualitative approach (Marconi & Lakatos, 2011). We opted to carry out a multiple case study with a view to investigate the phenomenon in more than one unit of analysis (Yin, 2010). Although there is no ideal number of cases, we follow Eisenhardt's recommendations (1989) regarding the adoption of four cases.

Four information technology (IT) companies working with consultancy and development in the software market were selected. For that: in 2013, the IT market in Brazil was worth US$ 61.6 billion, of which US$ 10.7 billion originated in the software market, and US$ 14.4 billion in services, that is, more than 40% of the IT market (ABES, 2014). Similarly, companies in the IT sector tend to have above average EO in relation to other sectors (Martens, Freitas, & Andres, 2011), in addition to working strongly with projects (Dai & Wells, 2004). The choices of companies were influenced by convenience, while respecting the following criteria: (i) belonging to the software market; (ii) carrying out consultancy work and software development; (iii) working with PM; (iv) possessing at least one PMO; and, (v) easy access to the organization, and managers and members of the PMOs.

A pilot case study was carried out beforehand, consisting of one of the cases presented here. Data were collected between November and December of 2014, with multiple sources of evidence being considered (Yin, 2010): a semi-structured interview, analysis of documents and filed records. A PMO manager in each company analyzed was interviewed, giving a total of four interviews. A script covering aspects of the three theoretical axes, the company and the interviewee, as well as elements that allow for the association of PMO to EO, was followed. These interviews lasting approximately 1 hour and thirty minutes were recorded and then transcribed, resulting in 78 pages of content. Project charters, e-mails, correspondence, notes (in diaries and note apps, for example),

proposals, and update and PM reports constituted the documents analyzed. Budgets, flow charts, and other organizational records composed the third evidence source: filed records. The multiple sources of data were integrated, converging in a triangular way, thus constituting a data analysis strategy (Yin, 2010; Martins & Theóphilo, 2009).

Data reduction, followed by its presentation, delineation and a search for conclusions, compose the analysis of data obtained (Martins & Theóphilo, 2009). After this, a general description strategy of the case to concretize the analysis was carried out (Yin, 2010). Following recommendations by Eisenhardt (1989), an intra- and inter-case analysis was carried out, to identify similarities and differences between the cases, allowing various perspectives. In this article, special attention is given to inter-case analysis. Finally, the data were analysed using the pattern-matching technique (Yin, 2010), making a comparison between the procedures adopted in the cases studied and the conceptual base.

4. ANALYSIS AND DISCUSSION OF THE RESULTS

In this section, the main results are presented and analyzed, in addition to being discussed from the perspective of literature.

4.1. Characteristics of the Software Companies and the Interviewees

With the aim of guaranteeing the confidentiality of participants, the companies are denominated as *Alpha*, *Beta*, *Gamma* and *Delta*. Table 3 presents their main characteristics.

Table 3. Company Characteristics

Company	Alpha	Beta	Gamma	Delta
Origin	American	Brazilian	Brazilian	Uruguayan
Head office	São Paulo	São Paulo	São Paulo	São Paulo
Time in the market	36 years, 13 in Brazil	31 years	27 years	36 years, 11 in Brazil
Nº of staff	More than 1,000	More than de 6,000	More than 15,000	More than 500
Principal area of business	Software and application development			IT Consultancy and related activities

Source: Devised by the authors

The four companies have been operating in the software market for more than 25 years, have a workforce of more than 500 employees and, according to criteria adopted by BNDES, fit into the category of large company because they have an operational gross annual revenue above R$ 300 million (BNDES, 2014). All work with PM and have PMOs.

A PMO manager was interviewed in each company, giving a total of four interviews (Table 4). To ensure confidentiality, the interviewees in companies *Alpha*, *Beta*, *Gamma* and *Delta* were designated, respectively, “E1”, “E2”, “E3” and “E4”.

Table 4. Interviewee characteristics

Interviewee		E1	E2	E3	E4
Company		Alpha	Beta	Gamma	Delta
Qualifications		MBA	Post-graduation	MBA	Master’s (ongoing)
Graduation area		Engineering	IT	IT	Accounting
Current function		PMO manager	PMO manager	PMO manager	Project manager
Time in the area	with projects	15 years	17 years	14 years	18 years
	with PMOs	2 years	4 years	9 years	6 years
	In the company	2 years	4 years	16 years	3 years

Source: Devised by the authors

The interviewees are corporate PMO managers in their respective companies. The average time working in the project area is 16 years, varying in the PMO area from 2 to 9 years.

4.2. PMS in the Companies Studied

The interviews held allowed for the identification of some PMS characteristics listed in Cooke-Davis, Crawford & Lechler (2009). Two companies presented the Innovation system (*Gamma* and *Delta*), one operated the Entrepreneurship/Intra-preneurship system (*Beta*) and one used Classic PMS (*Alpha*).

The interviewees were unanimous on two points: (i) the strategic focus of their companies is on the criterion of value through innovation, with an emphasis on customer service, and (ii) the companies strive for an advantage through innovation in

their products, services and processes. Two of the elements that characterize the Innovation system, differentiation through innovation and creativity, were those considered important by *Beta*, *Gamma* and *Delta*. However, the Innovation system was identified only in *Gamma* and *Delta*.

All the companies work with complex projects, but *Beta* alone highlighted the complexity of their PM. Innovation as a means of obtaining the best financial results, excellence in leadership and the existence of a high level of autonomy were identified solely in *Beta*, confirming the fact that this is the only company to have an Entrepreneurship/Intrapreneurship PMS.

Operational excellence and efficiency in processes were pointed out by *Alpha* and *Gamma* as a source of competitive advantage. *Alpha* emphasized that dealing with complex projects has led the company to quickly learn a new way of handling projects to improve the efficiency of its processes, revealing aspects of Classic PM.

4.3. PMOs in the Companies Studied

Although the four companies operate in the same sector, are the same size and enjoy international visibility, the configuration of their PMOs is different. Alpha uses a PMO focused on support for the project team, namely a PSO. *Beta's* PMO is classified as a PMCOE, for its focus is to ensure that project methodologies are adopted and utilized. PrgMO is the type of PMO found at *Gamma*, due to its active participation in the carrying out of projects. The PMO at *Delta* is the type known as PMCOE, for its functions include a high level of methodological support and projects carried out.

The offices of the four companies function as a support for the project team, though the PMOs at *Beta* and *Gamma* also offer the teams orientation. At *Delta*, the PMO incorporates the function of support to the coordination of project managers and the projects themselves. Only the PMO at *Alpha* deals with organizing documents related to projects, while the PMOs at *Beta*, *Gamma* and *Delta* monitor and control the performance of projects in their respective companies. The development and application/training of courses focused on the area are part of the functions of the PMOs at *Beta* and *Gamma*, along with the drawing up of policies, procedures and other directives connected to the project area.

It falls to the PMO at *Gamma* to look after and sustain the project portfolio, as well as define goals and monitor corporate and project results. *Delta's* PMO is responsible for establishing, continuing to develop and managing methodologies and processes, besides carrying out intermediation between projects and their stakeholders.

On the issue of responsibility for projects, the PMOs at *Alpha* and *Beta* are exempt from responsibility, unlike those at *Gamma* and *Delta*. While *Gamma's* PMO is ultimately responsible for all company projects, that at *Delta* is limited to responsibility for the projects it carries out. Finally, the PMOs at *Alpha* and *Beta* share their members with other teams or offices, while *Gamma* and *Delta* have project professionals who are exclusive to their own offices.

4.4. Dimensions of EO in the PMOs of the Companies Studied

The dimensions of EO (innovativeness, risk-taking, proactiveness, competitive aggressiveness and autonomy) were identified in the company PMOs studied, albeit at different levels.

The first dimension, **innovativeness**, is configured in a similar way at *Beta* and *Gamma*, since the presence of the same elements was identified in their PMOs. Both *Alpha* and *Delta* presented three elements of this dimension, with just two of these common between them. Both encourage the PMO to adopt original and experimental approaches to solve problems and allow the office to be innovative in processes and work methods. While innovative projects carried out by *Alpha* receive external financial resources, *Delta* has numerous new projects. It remains to highlight that there was unanimity among the PMOs in the four companies both in the adoption of original approaches and experimentation for the resolution of problems and also in the application of new processes and work methods in their own office. The PMOs at *Beta* and *Gamma* are encouraged to participate in projects that involve research and the development of new products, just as the operation of the PMO with new projects is a constant for three of the four companies (*Beta*, *Gamma* and *Delta*). In fact, the PMOs at *Alpha*, *Beta* and *Gamma* receive financial resources from third parties to carry out such projects. The offices at *Beta* and *Gamma* have members of their team dedicated to this activity.

Regarding the dimension of **risk-taking,** it can be verified that *Beta's* PMO most presents elements of this dimension. High-risk projects and very high chances of profit are present in the daily routine at *Beta*, *Gamma* and *Delta* PMOs, while in the PMO at *Alpha* there are only indications of the existence of this element. At *Beta*, the atmosphere tends to stimulate the company's bold attitude. Only the PMOs at *Beta* and *Gamma* presented the element related to the adoption of a bold and aggressive position on the part of the PMO in situations of uncertainty, which lead it to exploit potential opportunities.

In relation to the dimension **proactiveness,** it was identified in all its elements in the PMOs at *Alpha*, *Beta* and *Gamma*. All the PMOs participate in the introduction of novel ideas both in the market and in the company itself. It is also possible to verify that the PMOs in these companies participate proactively in actions carried out in the market, for example in the launching of new products. On the other hand, no evidence of this element was found in *Delta*'s PMO. Still with *Delta*, it was not possible to identify clearly its participation in monitoring the environment continuously in a search for new ideas and products for its projects; nor in the contribution of the office so that the company has a favorable position in relation to its competitors.

As for **competitive aggressiveness**, whether in the intention of copying business practices or techniques utilized by competitors, or learning from them the best way to deal with projects, competitive benchmarking is a common practice in the four PMOs analyzed. On the other hand, it can be verified that none of the four cases adopts non-conventional competitive methods or those that eliminate competitors. There was no evidence found to show that the offices of *Alpha*, *Gamma* and *Delta* act in an aggressive or intensely competitive way. *Beta's* PMO is the office that presents the most elements of the dimension of competitive aggressiveness.

Analyzing how the elements of the dimension of **autonomy** in the PMOs at the four companies are configured, it is possible to note that only the PMOs at *Beta* and *Gamma* present all the elements identified either integrally or partially. The PMOs in the four companies encourage their team to work autonomously, while those at *Beta* and *Gamma* are encouraged to make their own decisions and to pursue new business opportunities. It was noted in the *Beta* and *Gamma* PMOs that their team plays an important role in the identification and selection of projects and opportunities.

4.5. Manifestation of EO in the PMOs of the Companies Studied from the Perspective of the Strategic PMS Model

Adopting the elements presented by Cooke-Davis, Crawford & Lechler (2009) to identify the PMSs in the companies, as well as the elements that allow for the characterization of the PMOs proposed by Dinsmore (1998), it was possible to classify the four companies analyzed and their PMOs in the Strategic PMS Model (Figure 3).

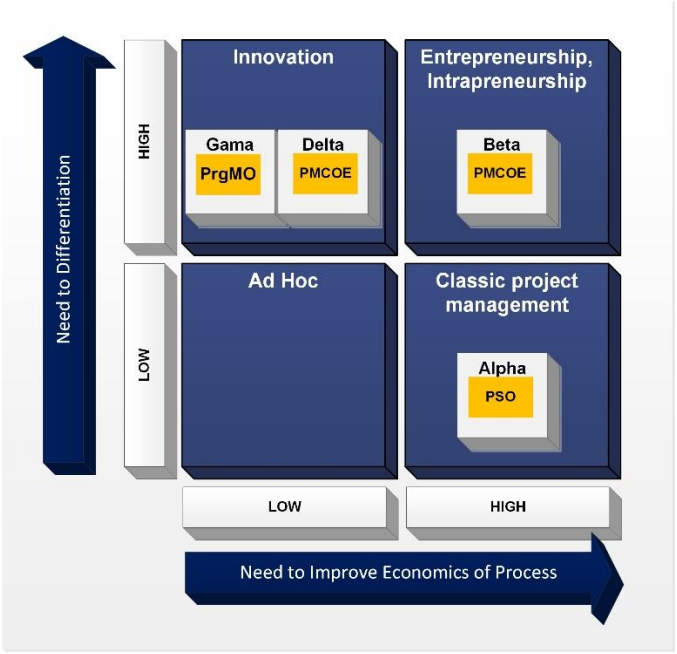

Figure 3. Software companies and the PMS Strategic Model
Source: Devised by the authors, based on Cooke-Davis, Crawford & Lechler (2009).

No company was classified in the *Ad hoc* system, while two companies were classified in the Innovation system (*Gamma* and *Delta*) with different PMOs (PrgMO and PMCOE, respectively). *Alpha* was classified as being in the Classic PM system, with its PMO as type PSO, and *Beta* was classified in the Entrepreneurship/Intrapreneurship system, with a PMCOE type PMO.

To analyze the EO in PMOs with PMS as a basis, Table 5, which describes the synthesis of the results of the identification of the dimensions of EO in the PMOs was devised. In this table can be found the types of PMSs and PMOs, as well as the dimensions of EO and its elements (respectively, columns 1 and 2).

The following premises were adopted in order to consider the presence of the dimension of EO in the PMO: more than 50% of the elements of each EO dimension

classified as 'identified' (●), the cited dimension was considered 'identified' (or DI); elements classified as 'identified' (●) and 'partially identified' (⦸) and together correspond to at least 50% of the total of the elements of the dimension, the cited dimension was considered 'partially identified' (or DPI); in the other cases the dimension was considered as 'non-identified' (or DNI).

With the cited table as a basis, it can be suggested that the system of Classic PM has a dimension of EO – proactiveness – since this dimension was identified in the PMO type PSO at *Alpha* through the presence of all the elements that characterize it. It is also possible to consider that the dimensions of innovativeness, risk-taking and autonomy can be observed in the system mentioned, keeping in mind that these dimensions were partially identified in *Alpha's* PMO.

In relation to the Entrepreneurship/Intrapreneurship system, the dimensions innovativeness, risk-taking, proactiveness and autonomy were identified in the PMCOE type of PMO at *Beta*, while the dimension of competitive aggressiveness was partially identified.

Regarding the Innovation system, two types of PMO can be found: PrgMO at *Gamma* and PMCOE at *Delta*. Such a situation allows us to identify the possible differences between the two, even though they are operating in the same PMS. In the case of Gamma, whose PMO is PrgMO, four dimensions were identified – innovativeness, risk-taking, proactiveness and autonomy. In the case of *Delta*, whose PMO is the PMCOE type, the dimensions of innovativeness, risk-taking, proactiveness and autonomy were partially identified. It can be verified, therefore, that the same system presents two offices of different types, which tends to reflect in the dimensions of EO identified.

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Table 5. EO in PMOs in software companies and PMSs.

Dimensions of EO and their elements		Company	*Alpha*		*Beta*		*Gamma*		*Delta*	
		Type of PMS	Classic PM		Empr./ Intr-pren.		Innovation		Innovation	
		Type of PMO	PSO		PMCOE		PrgMO		PMCOE	
IN	The PMO is encouraged by higher administration to carry out D&P projects that involve innovation, as well adopting competitive leadership practices, making financial resources available for such.		⦸	DPI	●	DI	●	DI	⦸	DPI
	In the past 5 years, the PMO has dealt with many new projects.		○		●		●		●	
	Changes in the project carried out by the PMO have been fairly drastic over the past 5 years.		○		⦸		⦸		⦸	
	The organization encourages the PMO to adopt original, experimental approaches to resolve problems.		●		●		●		●	
	The PMO is allowed to innovate very much in its processes, preferably devising its own processes and work methods.		●		●		●		●	
	The PMO has financial resources from third parties to carry out innovation projects.		●		●		●		⦸	
	The PMO has human resources (its own or external) dedicated to innovative activities.		○		●		●		⦸	
RT	The projects with which the PMO works are high risk and present chances of very high returns.		⦸	DPI	●	DI	●	DI	●	DPI
	The nature of the environment allows the PMO to act boldly to achieve the desired results.		⦸		●		⦸		⦸	
	The PMO tends to take calculated risks in carrying out its projects, concerning itself with the measuring of risks.		●		●		●		●	
	In situations of decision making that involve uncertainty, the PMO is allowed to adopt a bold, aggressive posture with a view to maximizing the probability of exploiting potential opportunities.		○		●		●		○	
	The PMO prefers to be quick in potential solutions for its project, accruing financial expenses		○		⦸		⦸		○	
PR	The PMO participates proactively in actions that the organization takes in the market, to which competitors react.		●	DI	●	DI	●	DI	○	DPI
	The PMO participates in the introduction of new projects for products/services in the market, new administrative techniques and new operational technologies, etc.		●		●		●		●	
	The PMO carries out continuous monitoring of the environment in search of new ideas and products for its projects.		●		●		●		⦸	
	The PMO contributes so that higher administration is ahead of its competitors in the introduction of new ideas and products (projects).		●		●		●		⦸	
CA	The PMO acts in an aggressive and intensely competitive way.		○	DNI	⦸	DPI	○	DNI	○	DNI
	The PMO acts according to the actions of the competition.		○		⦸		○		⦸	
	The competitive methods used by the PMO are considered non-conventional.		○		○		○		○	
	The PMO carries out competitive benchmarking (it copies the business practices or techniques of successful competitors etc.).		●		●		●		●	
	Aggressive acts in marketing new projects or products that involve the PMO are carried out by the PMO/organization.		○		●		⦸		○	
AU	The PMO encourages efforts by individuals and/or teams that work autonomously		●	DPI	●	DI	●	DI	●	DPI
	The PMO allows its individuals and/or teams to pursue business opportunities, take their own decisions, without constant reference to supervisors.		○		⦸		⦸		○	
	PMO staff play an important role in the identification and selection of projects and opportunities that the organization pursues.		⦸		●		●		⦸	
	There are established practices for the development of entrepreneurial behavior in the organization and in the PMO.		○		●		●		●	

Source: Devised by the authors, based on field research. Key: EO Dimensions – IN= innovativeness; RT = Risk-taking; PR = proactiveness; CA = competitive aggressiveness; AU = autonomy. The elements – ● = identified; ⦸ =partially identified; ○ = not identified. The dimensions – DI = dimension identified; DPI = dimension partially identified; DNI = dimension not identified.

From the results, it can be suggested that the greater the need for differentiation in projects, products and services, the greater the probability of identification of all the dimensions of EO in the PMOs in the companies classified in the Innovation, Entrepreneurship/Intrapreneurship systems.

The results also allow us to suggest that the manifestation of EO tends to vary depending on the type of PMS utilized, as verified in two of the companies, which have the same system (innovation), though two types of PMO (PrgMO and PMCOE) with different manifestations of EO. Moreover, the manifestation of the dimensions of EO can occur in different ways in the same type of PMO, for example those at *Beta* and *Delta* (both type PMCOE), corroborating the statement by Wales, Monsen and McKelvie (2011) that EO manifests in different ways inside organizations, in several situations and environments, depending on the entrepreneurial actions and behavior adopted.

Just as the environmental, structural and strategic variables, and the personality of the leader him/herself can influence the way in which entrepreneurship is developed in the organization (Miller, 1983), the manifestation of EO in a PMO, or in a medical association, or in companies in different segments, can also be influenced by such variables and present themselves in different configurations. In a study carried out in a non-profit making medical association, Lacerda, Belfort and Martens (2015) verified the presence of innovativeness, proactiveness and risk-taking dimensions in the actions taken by the organization. A study of software companies considered to be reference points in growth and entrepreneurship (Freitas, Martens, Boissin, & Behr, 2012) verified the presence of the five dimensions, while demonstrating the relevance of innovativeness in the context. In a study of food industries, EO was characterized by just some dimensions and not always the same ones, depending on the factors particular to each organization (Martens, Salvi, Marmitt, Pereira, Freitas, & Both, 2011). Other studies also present results that refer to the various ways in which EO manifests in the most diverse organizations, for example in family (Casillas, Moreno, & Barbero, 2011; Craig, Pohjola, Kraus, & Jensen, 2014) and non-family (Craig, Pohjola, Kraus, & Jensen, 2014) companies. The research mentioned ratifies the reliability of the results in this study, in the sense that the four PMO analyzed present differences in the manifestations of the dimensions of EO.

5. FINAL CONSIDERATIONS

In light of what has been shown here and considering the characteristics presented by Dinsmore (1998) to classify a PMO, the result is confirmed regarding the PMOs in the *Alpha*, *Beta*, *Gamma* and *Delta* companies, which are, respectively, of the types PSO, PMCOE, PrgMO and PMCOE. The adoption of these types of PMO will depend not only on the stage of maturity of the PM, but also on the organizational context into which it is inserted (Hobbs & Aubry, 2008). The choice of PMO type should be based on information on the type of project being managed, organizational strategy and the PMS existing in the company (Cooke-Davis, Crawford, & Lechler, 2009).

On the question of the manifestation of EO, the results presented corroborate the affirmation that EO manifests in different ways (Wales, Monsen, & McKelvie, 2011), and is influenced by the context into which it is inserted (Miller, 1983; Lumpkin & Dess, 1996).

Considering that the way in which the projects are managed and systematized exerts influence on the company's PMS (PMI, 2013) and that EO is influenced by internal aspects in the organization (Miller, 1983; Lumpkin & Dess, 1996), as both PMS and EO have their actions delineated by external aspects (PMI, 2013; Miller, 1983; Lumpkin & Dess, 1996), it is possible to suggest that the PMO tends to influence the PMS, just as the PMS can influence the PMO.

Finally, it can be considered that, *depending on the PMS* (Classic PM, Entrepreneurship/Intrapreneurship and Innovation) *and the type of PMO adopted by the organization* (PSO, PMCOE and PrgMO), *EO can manifest in different ways* (innovativeness, risk-taking, proactiveness, competitive aggressiveness and autonomy). This result can be verified in the case of *Beta* and *Delta* companies, whose systems are Entrepreneurship/Intrapreneurship and Innovation respectively, and the PMO is type PMCOE. The two offices have different PMS's, though in both there is clearly the presence of the dimensions of innovativeness, risk-taking, proactiveness and autonomy.

As an academic contribution, this study analyzed the relation between the themes PMOs and EO, considered to be a gap in research and thus capable of generating important scientific and organizational results, mainly in software companies. It is a new perspective on the themes of PMOs and EO, considered strategic in their field of study, but rarely explored together. The practical contribution

of this work is in helping software companies to discover how the relation between their projects office and EO occurs; it also contributes so that the PMO utilizes EO practices when carrying out its activities and the company utilizes both together to better conduct its strategy.

One limitation could be attributed to the way the analysis was carried out, since another researcher could adopt another way of analyzing the data and presenting the results. We opted for intra- and inter-case analyses among four selected cases; another researcher could adopt an inter-case analysis between just two. Subjectivity is also one of the limiting factors in this research, for it results from reflections by the researcher on what he/she is researching. In order to minimize this subjectivity, we sought to redouble our reading, research and reflections on both the themes studied and the results analyzed. Another limitation refers to the holding of just one interview per company. The involvement of more project team members could eventually lead to more insights and information regarding the subject.

Following this study, it is recommended that others with a quantitative approach be carried out, with the purpose of verifying whether the results can be confirmed in a greater number of companies in the software sector. It is also suggested that empirical research be done with a qualitative and quantitative approach in other sectors that work with projects and have PMOs, with the aim of verifying whether the relation between PMOs and EO occurs in the same way or whether there are other elements that merit consideration. One final suggestion regards conducting out of studies that could lead to the definition of indicators that allow for the measuring of the relation between PMOs and EO and the impact of this relation on strategy and on the results obtained by projects and by companies.

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