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The influence of the level of competencies and maturity in Projects Management in the corporative result of a Manufacturing Sector Company

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RESUMO

The knowledge and project management practices contribute to the strategic execution, and the maturity of these methodologies increases significantly the probability of success project. Even though, corporations, which instilled this methodology on their strategies, have tabled a number of projects showing less than satisfactory outcomes, due to set of factors linked to management and to corporate strategy implanted. This article aims to analyze the influence of competence and maturity in project management of matrix teams and managers in the results of projects and therefore on the corporate results. The research is qualitative, based on the method of single case study. The main results indicate the existence of a strong influence between skills and maturity in project management in operating performance and results of the organization.

PALAVRAS-CHAVE: Gestão de projetos. Equipes matriciais. Competências em gestão de projetos. Maturidade em gestão de projetos. Indústria de transformação.

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A Influência do Nível de Competências e de Maturidade em Gestão de Projetos no Resultado Corporativo de uma Empresa do Setor de Transformação

ABSTRACT

Os conhecimentos e as práticas em gestão de projetos contribuem para a execução estratégica, e a maturidade na aplicação dessa metodologia aumenta significativamente a probabilidade do sucesso de um projeto. Ainda assim, empresas que adotaram a gestão de projetos em sua estratégia têm apresentado uma série de projetos com resultados abaixo do nível satisfatório, em razão de um conjunto de fatores vinculados tanto à gestão quanto à estratégia corporativa. Neste artigo, o objetivo é analisar a influência das competências e da maturidade em gestão de projetos das equipes matriciais e dos gerentes no desempenho dos projetos e, consequentemente, no resultado corporativo. A pesquisa é qualitativa, baseada no método de estudo de caso único realizado em empresa do setor de indústrias de transformação. Os principais resultados apontam para a existência de forte influência das competências e maturidade em gestão de projetos no desempenho operacional e nos resultados da organização.

KEY-WORDS: Project management. Matrix team. Project management competencies. Project maturity models. Manufacturing industry.

1 INTRODUCTION

The dynamic and competitive business environment requires organizations to review their form of management, stimulating them to better define their goals and priorities in order to become more efficient and effective. According to trend announced by Porter (1996, p.62), "the companies need to be flexible to rapidly react to competition and to changes in the market. They have to take measurements and compare themselves continuously with the competitors to achieve best practices". In addition, they need to be skilled in the use of their abilities, in order to respond immediately to new demands.

Considered the economic sectors, an important role is played by the manufacturing industry, also called the process industry, whose main purpose is, according to the American *Production and Inventory Control Society* (APICS), add value to materials through mixing, separation, conformation or chemical reactions (APICS, 2010). This type of industry has extensive representation in the economic development of Brazil, in view of the high performance of the manufacturing sector, common in not developed or developing countries. However, its production processes are complex and require a large number of regulatory mechanisms in order to maintain high levels of production(Borges & Dalcol, 2002). According to data from the Institute of Economic Research (ISAP), since the 1980s, it appears that the processing industry in Brazil has decreased its participation in the Gross Domestic Product (GDP) and in total occupation of the country. Between 1985 and 2007, had its relative participation reduced to 17.6% and in 2011 it was at 14.6% (Ipea, 2008). This fall raises concern in terms of competitiveness of businesses and also of the countries. Still, according to Ipea, there is a low expenditure on research and development and what prevails in Brazil, are strategies of innovation imitative, in which a considerable part of the resources is invested in the purchase of machinery, equipment and services of third parties.

Within this context, this article seeks to analyze the strategic and operational behavior of a company that operates in the field of services, offering integrated solutions for engineering, construction and

electromechanical assembly for activities such as implantation, modernization and maintenance of industries of processes. The company Montcalm Industrial Assemblies S.A., founded in 1971, has evolved significantly over these years in the use of techniques and tools of Project Management. Currently, it deals with external challenges such as the decrease in the participation of the manufacturing industry in GDP (Confederação Nacional da Indústria (CNI), 2011) and internal, inherent to the own management. The company operates based on a matrix structure and its internal competencies, processes and management systems and monitoring focus on meeting deadlines, the maintenance of standards of quality and performance of projects.

In a global and hypercompetitive environment, project management is a resource to perform business multidisciplinary operations way better, cheaper and more Quickly. When integrated with a team of people with correct bounds, this resource can transform information and other inputs into tangible results, besides helping the organization to deal effectively with the contemporary challenges, such as working groups that are geographically dispersed, integration of complex tasks, risks and non-linearity. However, success is not automatic or at random, because it depends on multidisciplinary efforts involving people, complex environment and support of the organization(Thamhain, 2012).

Despite of the clear importance of project management at the heart of the organization studied, it was identified in the course of the last two years, a series of projects with results below the satisfactory level due to a combination of factors linked both to the management of projects and the corporative strategy implemented. According to Sauser, Reilly and shenhar (2009), when important projects fail, research generally falls in the technical vector and engineering. However, in many cases, the cause of the failure is not technical and managerial but, because the problem emerges from administration failures in the administration and in the selection of the best approach for the specific project. Still on the result projects, Rabechini and Pessoa (2005) consider that to succeed it takes effort, because the maturation in projects management involves deciding for a series of

consistent actions, involving the development of skills in multiple instances, but it takes time and has an impact across the organization.

Such context suggests to assess whether the model of project management and maximization of powers adopted widely by the company analyzed is suitable to the management of the business. The main question that guided this study was: How does the level of skills and maturity in project management of matrix teams and of the manager influence the performance of the projects and consequently the corporate outcome?

As a contribution, this study proposes to assist decision-makers in the clarification of a practice that directly impacts on the sustainability of the business, on the understanding that the competence gaps not satisfied throughout the project, increase the degree of risk of delivery within the cost, time and characteristics previously defined, and may result in losses not expected and compromise the corporative result as a whole.

In addition to this section, in this article there are other four, namely: The bibliographic review on enterprise strategy and project management, the method, which describes the organization investigated and the research design, the presentation and the analysis of results and the final consideration.

2 BIBLIOGRAPHIC REVIEW

In the scientific literature, there are several researches and theories related to the administration of business that would form the basis for the analysis of the organization studied, however, for effective contribution, the theoretical framework of this study is focused on two pillars that support the analysis of data: business strategy, covering positioning and competitive advantage, and projects management, involving the description of concepts, skills, and maturity and organizational structure.

2.1 BUSINESS STRATEGY

The key to competitive success lies in the ability of the organization to create unique value. Having competitive advantage means that, in

comparison with the competition, a competitor operates at a lower cost and charges more for their product, or even both, overcoming the competition in terms of financial performance. The competitive advantage can result from a combination of some factors, such as the choice of a set of internal activities that produces a *unique mix* of value, concrete assets or intangible skills in such a way that the whole has more importance than the parties individually, thereby, the imitation among the competitors (Porter, 1996).

The current competition involves to better satisfy the customers, a very difficult task when considering the increase in the level of demand for higher quality and lower cost. The companies need to adopt strategies that achieve and maintain a competitive advantage, as strategies for cost and differentiation (generic strategies) are no longer enough (João & Piscopo, 2006). In this sense, the Delta Model of Hax and Wilde (2002) proposes an alternative strategy that allows placements to enable superior performance to the industry average, considering the dynamics of the competitive environment and the relationship with the customer. These authors highlight that this type of total solution to the client relies on a strong relationship that generates mutual learning (customer and company) and makes the replacement or imitation difficult.

2.2 PROJECTS MANAGEMENT

> Project is a venture with well-defined goal, which consumes resources and operates under pressure of deadlines, costs and quality. In addition, projects are, in general, considered exclusive activities of a company […] project management can be defined as the planning, scheduling and control of a series of tasks integrated in order to achieve their goals successfully, for the benefit of the participants of the project (Kerzner, 2007, pp.15-16).

For the *Project Management Institute* (PMI, 2013), a project is a temporary endeavor undertaken to create a product, service or result. All projects are temporary and have beginning and end defined. This temporality does not mean short duration, because projects can last from weeks to years. Although the project finishes, your product and your results may last for a long period of time (Carvalho & Rabechini, 2011).

According to the PMBOK Guide® (PMI, 2013), project management has five process groups - initiation, planning, implementation, control and completion - clearly interdependent and executed in the same sequence in any project, regardless of application area or sector. As the project progresses, it is also necessary to manage ten areas of expertise: integration, scope, time, cost, quality, human resources, communications, *stakeholders*, risks and acquisitions. The success of the project is strongly related to the efficient and effective management of these ten areas. When the projects are inserted into the framework of construction or industrial assembly, core activity of the company studied, add still four other areas of knowledge: Safety, which determines policies and responsibilities so that the project is planned and executed so as to prevent accidents and potential damage to persons or to property; environment, responsible for policies that aim to minimize the impact of the project on the external environment and natural resources, operating within the limits allowed by laws and regulations; financial, which includes the processes of acquisition and management of financial resources applicable to the project; Claims, which describes the processes required to prevent constructive claims, mitigation of the effects of those that occur and managing of demands in a fast and effective way.

In its annual report for 2011, with the participation of 754 companies, including at this list Montcalm Industrial Assemblies S.A. itself, PMSURVEY (2012) describes the key benefits of the practice of project management. The three most mentioned were: increase in commitment to the objectives and results (67%), availability of information for decision making (57%) and improving the quality of the results of the projects (56%).

It is identified at this environment the professional, the image of "project manager", that is designated by the organization and makes use of competences in project management by applying techniques, tools and knowledge that allow to set goals, balance conflicting demands between quality, cost, time and scope and adapt specifications, in order to meet the expectations and concerns of several parties interested(PMI, 2013).

The projects are often used as a means for the organization to complete its strategic planning (PMI, 2013). For the company to gain competitive advantage, it is necessary to implement an innovative strategy, whose execution can be made possible by means of the projects. According to Kerzner (2007), even if a company has a methodology of world level in project management, they will not be able to fill gaps in performance designed while it does not make use of adequate resources for this purpose. This sets a strong relationship between methodology and resources allocated. The author also says that, in practice, the fact that there are structured methodologies for project management it does not guarantee the success in itself.

In this sense, Crawford (2010) makes an exception: Despite of the benefits of managing, the projects can fail a few times, and two of the main reasons are to promote the best technician for manager or not to have structured processes to ensure that managers are properly trained and evaluated.

2.2.1 Competencies

To evolve in the use of projects management, the organization should consider the layers (individuals, teams and organization). Thus, companies that want to be more competitive must manage well the projects, administering the competencies of their resources, much more than adopting a *support software* (Rabechini & Pessôa, 2005).

In a broader panorama, Brandão and borges-andrade (2001) claim that there is a fruitful theoretical discussion about the concept of competence, in such a way that it can be interpreted in many ways. Some of the characterizations are listed in Table 1.

Authors	Characterization of the "competencies"
• Boyatzis (1982, mentioned by Brandão & Borges-Andrade, 2001) • McClelland (1973, mentioned by Brandão & Borges-Andrade, 2001)	Set of qualifications or characteristics underlying the person, that allows him or her to perform certain task and manage a situation.
	To be continued

	Continuation
• Le Boterf (1999, mentioned by Brandão & Borges-Andrade, 2001) • Zarifian (1999, mentioned by Brandão & Borges-Andrade, 2001)	It is not a set of attributes of the person, but his or her achievements in certain context, i.e., what the individual performs at work.
• Gonczi (1999, mentioned by Brandão & Borges-Andrade, 2001)	It is not only one set of skills and attitudes needed to engage in the activity, but also the performance of the person in a given context.
• Prahalad and Hamel (1990, mentioned by Brandão & Borges-Andrade, 2001)	They add economic or social value, since they contribute to the fulfillment of organizational goals. The *core competence* of the company is the combination of several skills that offer benefits to the consumer, being difficult to imitate.
• Dutra, Hipólito e Silva (2000)	The ability of the person to generate results within the strategic goals and organizational issues of the company, leading to the mapping of the expected result and the set of knowledge, skills and attitudes necessary for its achievement.
• Ruas (2005)	It involves three main dimensions: organizational, functional and individual/management. The main concept of competence is the ability to combine and mobilize adequate knowledge, skills and put them into action in a particular situation, preferably in their own professional activity.
• Fleury and Fleury (2001)	If on the one hand the notion of competency adds value to the organization, on the other hand, it must add value to the individual, i.e., the people, when developing essential skills for the success of the organization, they are also investing in themselves.

Chart 1: Characterization of the term "competencies"

Source: Elaborated by the authors

With respect to the types of skills in project management, Frame (1999, mentioned by Rabechini & Person, 2005) suggests three: skills and abilities of the individual in solving problems of projects; skills of the team in solving complex problems in context; multidisciplinary and competences of the company to create an environment that enables the involvement of individuals and of teams to play the projects effectively. Rabechini and Pessoa (2005) complement this vision affirming that the individuals must master the techniques and tools with a rather comprehensive list of needs of the project; the teams must be proactive and remain focused on the fulfilment of the objectives of the project; and the organization must institutionalize the practices of projects management.

2.2.2 Maturity

Investing in project management is a strategic concern of organizations that pass through a learning curve to reach maturity in the use of the methodology and, in this context, maturity is the development of systems and repeatable processes that ensure a high probability that each project obtain success (Kerzner, 2007). The author also suggests that, for a company to achieve excellence in project management , it must pass through five levels: 1) common language, whereby the organization recognizes the importance of project management as a useful methodology to achieve success; 2) Common processes that aim to replicate the success of a project in the other; 3) unique methodology, when the organization recognizes the possibility of obtaining synergy with the combination of various methodologies; 4) *benchmarking*, continuous process of comparing practices of management of projects developed by other organizations; 5) continuous improvement from what was learned. These stages can also be generically named as: embryo, recognition of senior management, recognition of middle management, growth and maturity.

The PMI (1999) proposes another model of maturity that references the main capabilities inherent in the project management - the Model OPM3 - which describes the following phases: 1) standardization and integration of methods and processes, aiming to establish a common language to be practiced by everybody; 2) development of metrics to measure the performance of the projects regarding the term/cost/quality; 3) commitment to project management procedures ; 4) prioritization of projects aligned to the organizational strategy; 5) continuous improvement to the accessibility to the lessons learned; 6) establishment of success criteria; 7) creation of mechanisms to evaluate the competence of resources/project teams; 8) Appropriate allocation of staff according to the organizational strategies; 9) organizational aspects, structuring of project teams, considering the organizational forms existent; 10) teams, training of culture based on project teams , considering innovation and creativity.

For Bouer and Carvalho (2005), the project management is not simply a methodology and its strategic domain includes systems that ensure

the delivery of multiple projects of the organization; the model must still adapt activities, strategic priorities and infrastructure; strengthen the link between organizational strategy and execution, increase the success rate of projects; include capabilities that differ the organization from the others, and the organizational routines should be aligned to the project portfolio management , prioritizing projects aligned to the strategy.

2.2.3 Organizational structure

> The structure of an organization can be defined as the result of a process through which the authority is distributed, the activities from the lowest levels up to the board of directors are specified and a communication system is designed so that people carry out activities and exercise the authority to which they are entitled to the achievement of the organizational objectives (Vasconcellos & Hemsley, 2002, p. 3).

The increase in turbulence in the business environment made inadequate many of the traditional structures, and then innovative structures arose, which respond faster to changes, among them the matrix structure (Vasconcellos & Hemsley, 2002). Corroborating this positioning, from the perspective of projects, Kerzner (2007) highlights that, in recent years, businessmen realized that organizations should be more dynamic and able to restructure quickly, which may require adoption of new hierarchical formats.

For the PMI (2013, p.28), "the organizational structure is an environmental factor that can affect the availability of resources and influence the way in which the projects are conducted. The structures vary from functional to designed, with several array structures". The weak matrix gets close to a functional structure to a great extent, and the role of the Manager is similar to that of a coordinator or facilitator. The strong matrix possesses many characteristics of the designed ones and may have project managers full time with authority over the administrative staff to work on a full time project. The balanced matrix recognizes the need of the manager, but this has no authority over the project.

Kerzner (2009) identified factors influencing the choice of the organizational structure, among them: the project size, duration of the project, physical location of the project, available resources and specific

aspects of the project, experience of the organization in projects management, philosophy of the senior management of the company as to project management, these last two related to the maturity of the company in project management.

3 RESEARCH METHOD

This is an applied research, qualitative approach and of exploratory-descriptive nature; the method used for its conduct was the single case study. Aiming at building theoretical platform on the subject and following the recommendations of Martins and Theóphilo (2009), it was started by the bibliographical research, which involved raising studies already published about the issues related to the research question. Then, we adopted the approach called single case study: an empirical study that examines in depth a contemporary phenomenon in the context of real life (Yin, 2010, p. 39).

The empirical study sought to identify to what extent the model of project management used by Montcalm Montagens Industriais S.A. fulfills at the level of maturity and competence in project management necessary to corporate success. The relevance of the event is marked in the history of company operations, whose portfolio of projects includes more than 4,000 works made by approximately 1,300 industries of cement, mining, cellulose and paper, textiles, chemicals and petrochemicals, fertilizers, oil and gas, power generation, metallurgy. In addition, the Montcalm appears as one of the 754 global companies that employs a methodology of project management in its strategy (PMSURVEY, 2012). The process of choosing the organization was symbiotic, on the one hand there was the domain of the characteristics and the knowledge of the projects of the company, in addition to the ease of access to information on the part of researchers; on the other, there was the perception of the representatives of the organization that discuss about the methodology that could contribute to the performance of the projects.

In order to organize the data, the researchers conducted an exploratory research based on the collection of secondary data obtained

from the analysis of documents provided by the company or public (Manual of the Project Manager, reports and *websites*) and also primary, obtained through the application of an individual questionnaire. As the objective was to compare the literature of project management with the practices of the company, the form was directed exclusively to the project managers working in the organization. The universe of the selected sample contained 22 employees. The structured form was distributed by electronic means, and out of this universe, 19 professionals returned it filled out, corresponding to 86.3% of the sample.

3.1 RESEARCH INSTRUMENT

From the literature review and the documents provided by the company, it was elaborated the instrument of research described in Table 2.

Objective of the research	Variables	Structured form	Items of the Data collection instrument
Identify the influence of the level of skills and maturity in project management teams and matrix of the manager in the result of the project	- level of integration between the areas of matrix support and the project manager. - Linking of the skills in projects relating to each area.	1St Structured form	Items from 1 to 13*
	- the level of skills and maturity in team projects of available matrix to support the management of projects. - expertise in project management that are the most important to the outcome.	2Nd Structured form	Items from 1 to 24*
	- integration between the standardized methods in organization and management of projects. - degree of familiarity of managers with these methods.	2Nd Structured form	Items 25 to 32*

Chart 2: Research instrument

Remarks: * items identified by letters
Source: Elaborated by the authors

It was performed a qualitative analysis of the responses given in the questionnaires. How each one of the professionals filled out the questionnaire individually, without prior clarification, there was the possibility of incorrect filling out, distinct responses from what was expected

for the topic. Under these circumstances, it was eliminated from the sample two questionnaires answered incorrectly, consolidating a base of 16 out of the 22 forms submitted, which corresponds to 72.72% of valid samples within the total universe of forms.

4 PRESENTATION AND RESULTS ANALYSIS

The results will be presented in two subsections: Characterization of the Organization and maturity and Competency in Project Management.

4.1 CHARACTERIZATION OF THE ORGANIZATION'

The Montcalm Industrial Assemblies S.A. is a company of the group Intercept holdings that operates in the field of services, offering integrated solutions for engineering, construction and electromechanical assembly for deployment, modernization and maintenance of industrial processes. The companies headquarter is located in São Paulo - Capital - and focuses on corporate management of the organization. The company also has a central logistics, which is responsible for the management of operational assets and resources of the company. Montcalm has promoted an internal restructuring, starting from a matrix structure, balanced, model practiced until the year 2007, for a strong matrix structure, model consolidated in the company in the year 2008 and that is in force up to now. In this same period, the company has adopted the PMBOK Guide® as a standard practice of project management and created its own Manual of the project manager, observing the precepts of PMI.

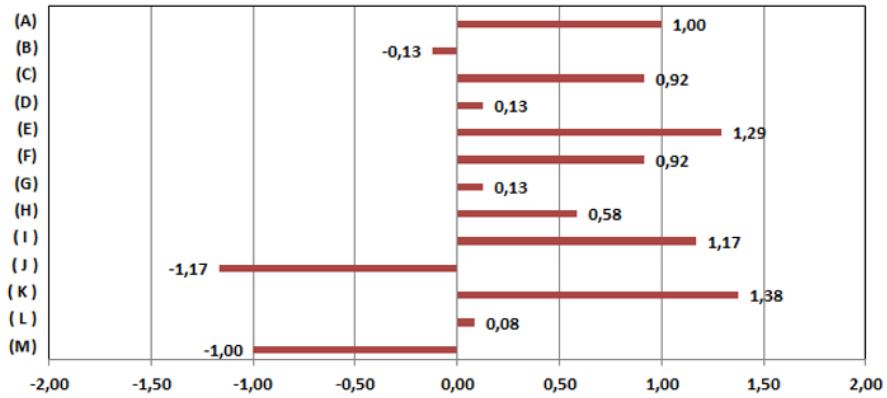
Within this period, it was organized the Department of Operations (PDO), represented by the Operations Director, responsible for leading the project managers. It was promoted then, the hierarchy of project managers and the definition of the matrix structure to support the management of Projects: Planning, Controlling, Human Resources, Quality, Legal, Purchasing/Acquisitions, Supplies and Logistics. The company has a framework of approximately 4,000 employees involved in an average of 20 projects with simultaneous implementation.

From the data collection and analysis of managerial finance data, in the period from 2000 to 2012, it was possible to verify a downward trend in the number of active projects: From 225 in 2000, to 32 in 2012. Despite of the narrowing of the portfolio, there was an evolution of company revenues, sign of the incorporation of projects with financial values systematically higher. It was also found a decrease in corporate results. The evolution of the mean value of the projects of the company, similarly, superior demands of managerial competence and full maturity in standardized and structured processes in the organization. Larger projects began to require knowledge in other spheres in addition to the technical, requiring knowledge from the manager related to political and legal issues, to trade unions relations, a more in-depth analysis of risks inherent to the projects and the structuring of KPIs (*Key Performance Indicators*), or key indicators of *performance*.

4.2 COMPETENCY AND MATURITY IN PROJECT MANAGEMENT

The data collection searched to identify the perception of Montcalm's project managers regarding the following aspects: (a) level of integration of these with the matrix support areas, from the linking of the competencies related to each structural area and (b) influence the level of competence and maturity in project management both of the support areas as well as in their own, in the performance of the projects of the company. In Figures 1, 2, 3, 4 and 5 and the Tables 3 and 4 below, it is shown the result of data collection.

Results obtained - the perception survey of matrix support



Matrix support in general skills

(A) Assessment of the need for resources to the project, qualitatively and quantitatively, due to the degree of maturity, responsibility and complexity required by the project, for the areas of technical support and quality/planning/Engineering.

(B) Assessment of the need for resources to the project, qualitatively and quantitatively, due to the degree of maturity, responsibility and complexity required by the project, for activities of RH/Financial/TI/Comptroller.

(C) Definition of resources of the departments of support, from the ratings above and a critical analysis of risks inherent to the project.

(D) Internal audits for compliance with regulations and standards defined for the project (corporate procedures/rules/plans).

Matrix support in skills related to Quality Management

(E) Critical analysis of the skills of quality/Planning/Purchasing/HR allocated in the project.

(F) Implementation of adjustment of staff to eliminate/minimize risks to the project related to the shortcomings of competence of the teams of support mentioned above.

(G) Critical evaluation of the criteria and contractual specifications for preparation of quality documentation required by the project.

(H) Identification and analysis of risk/impact of deviations of implementation in relation to the envisaged in the specification for the project.

(I) Preparation of documentation for the quality control (procedures, technical consultation, operational flowcharts) applicable to the project.

(J) Internal audits for compliance with regulations and standards defined for the project (corporate procedures/rules/plans).

Matrix support in skills related to the management of Planning

(K) Preparation of executive timelines and work plans applicable to the project.

(L) Preparation and standardization of documentation of planning to be used in the project, including approval of this with the *stakeholders* directly involved in the project (internal customers/external).

(M) Internal audits to verify compliance with executive plans defined for the design and development of action plans for correcting deviations identified.

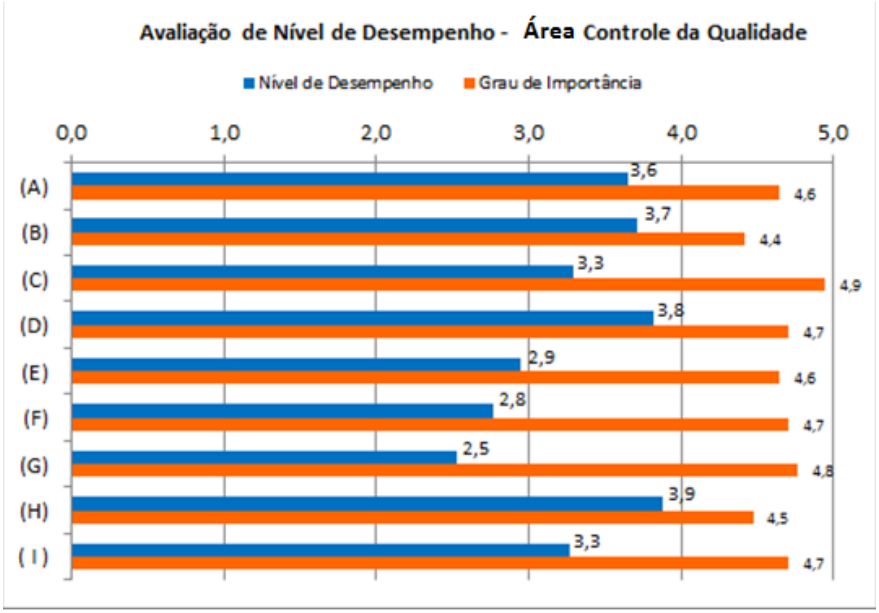
Figure 1: Evaluation of perception of matrix support 1st form

Source: Elaborated by the authors

Figure 1 presents the consolidated results of average ratings obtained from the responses of project managers to the first form. The value plotted on the graph represents the perception of the level of participation and integration of teams of matrix support that managers consider as adequate or excellent for the activities mentioned.

The range -2 to 2 refers to the level of responsibility and that the matrix unit should assume for essential functions, identified by letters (A) through (M). It is verified from the graph, the existence of activities that are strongly performed or of strong matrix responsibility, as audit activities, identified by letters (J) and (M), as well as activities of strong responsibility in the area of projects, letters (A), (E), (I) and (K). The other activities, identified between the scores -1 and 1 give rise to a mutual responsibility, suggesting strong integration between the team and the projects team. This diagnosis is essential so that the organization can analyze and possibly improve its model of participation and integration of competences in project management.

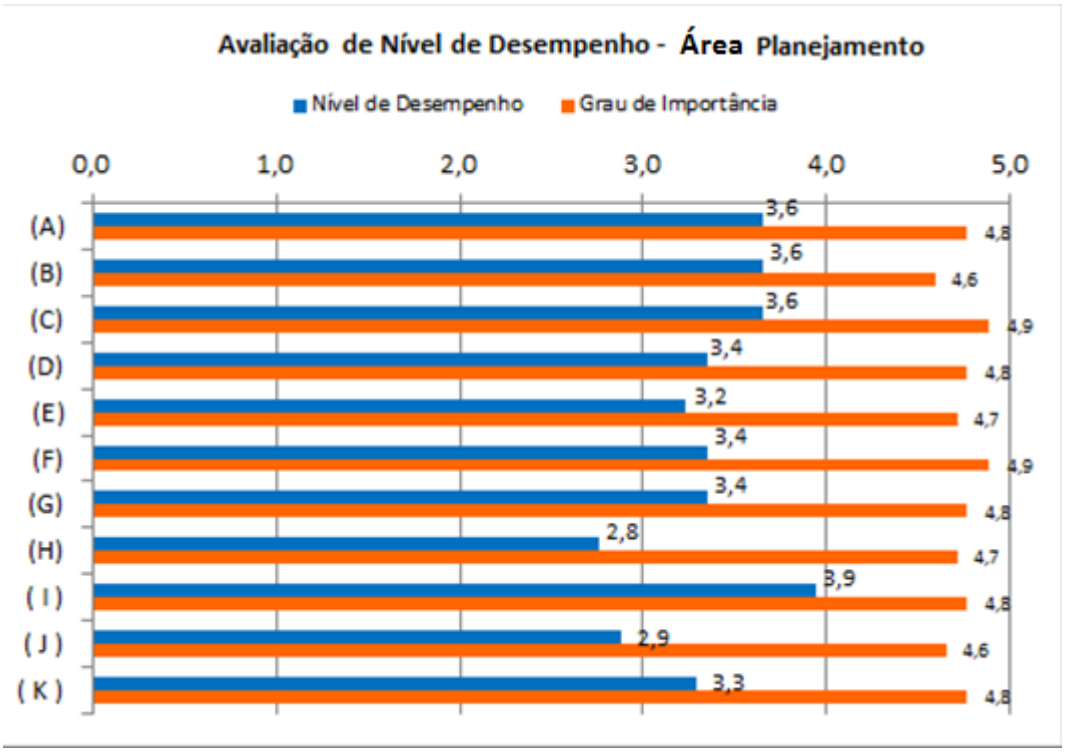
In the graphs represented by the Figures 2,3,4 and 5, it is shown the tabulation of data obtained from the second structured form of research applied in areas considered essential, according to representatives of the organization for the development of any kind of project: Quality, Planning and Human Resources. In these graphics it is illustrated the consolidated result of average ratings obtained. The Likert Scale (1 to 5) was used to evaluate a series of items of performance related to project management, as well as its degree of importance.



(a) There is support in terms of leadership in quality, with the provision of management and strategic knowledge, which clearly are aligned with the goals of the project.
(B) there is the full support of the above items supplied by management of the department.
(c) the department of quality of the project has conditions and skills to critically analyze the project documentation and promote the structuring of documents and procedures for the fulfillment of contractual requirements in terms of quality.
(D) The quality team is responsible for preparing reports for monitoring and control, such as the index of performance of welding, index of closure of CNR, among others, assertively and suited to the particularities of the project.
(e) the quality team uses the data stratified in these reports, proposing, through substantiated critical analysis, developments and plans of action in circumstances in which the target is not met.
(F) The Department of quality control analyzes critically the scope and competence to identify previously critical points within the enforcement of obligations, worthy of development of processes, procedures, and others.
(g) After the identification of these points, quality control performs assertively the performing of actions for the structuring of the procedures, calls of counseling and development of processes to ensure that they are deployed prior to the execution of the activity itself.
(H) The control of project's RQS carried out by the department of quality meets fully the demands and needs of the project.
(I) Widely speaking, assess the level of competence and maturity in the area of quality control within your project. **[Is it discipline or area or team?] R: it is the area.**

Figure 2: Evaluation of items of performance of Quality Control

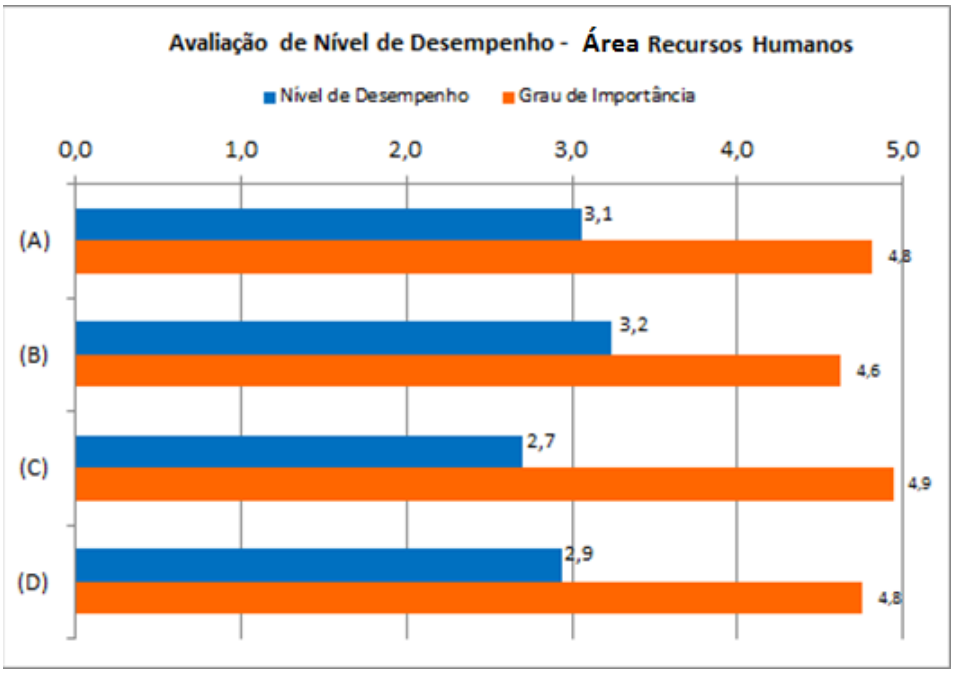
Source: Elaborated by the authors



(a) There is support in terms of leadership in the planning process, with provision for management and strategic knowledge that clearly are aligned with the goals of the project.
(B) there is the full support of the above items supplied by management of the department.
(c) the project makes use of a planning sector with competence and skill to structuring and drafting of assertive schedules and histograms.
(d) the project makes use of planning with competency for structuring and preparation of assertive periodic schedules.
(e) the technical file has the competence to work productively and efficiently regarding the distribution of project documentation to interested parties and promotes the substitution of controlled copies as new revisions are issued.
(f) measurements issued by the department are in line with the deadlines set and represent faithfully the scope of measurement applicable to the period.
(c) the department of quality of the project has conditions and skills to critically analyze the project documentation and promote the structuring of documents and procedures for the fulfillment of contractual requirements regarding this item.
(H) The activities related to the management and control of materials (quantities in stock, inventory, agility in the location, requests responsiveness agility) fully satisfy the needs of the project.
(I) the planning team has competency for the preparation of management reports, as S curve and Reports of efficiency, assertively with realistic projections adjusted to the reality of the project.
(e) the quality team uses the data stratified of this management reports, proposing, through substantiated critical analysis, developments and plans of action in circumstances in which the target is not met.
(I) Widely speaking, assess the level of competence and maturity in the Planning area within your project. **[Is it discipline orarea or team?]**

Figure 3: Evaluation of items of performance of Planning area

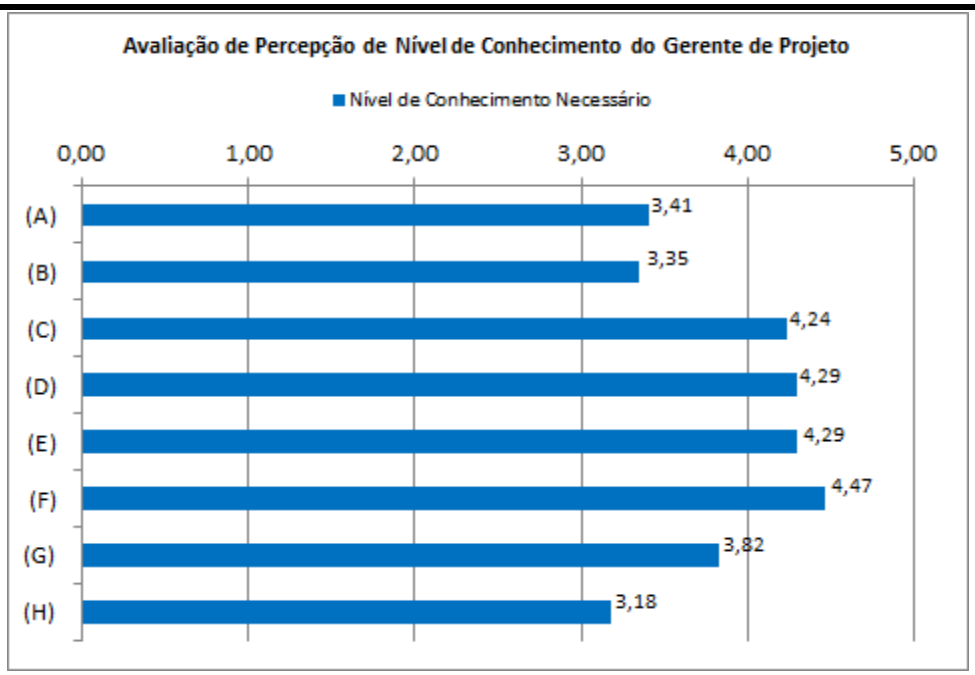
Source: Elaborated by the authors



(A) The HR structure available meets the demands of the project and provides resources according to the needs pre-stablished.
(B) The HR has competency for the management and control of benefits (medical assistance, food, transportation).
C) The HR has competency to meet the demands of recruitment and selection of skilled labor, in terms of agility, labor quality and assertiveness in my projects.
(d) There is a full matrix support through the application of resources able to meet technically strategic changes in goals and objectives in the course of the project.

Figure 4: Evaluation of items of performance of Human Resource area

Source: Elaborated by the authors



(A) Degree of understanding that the projects manager must have in the systems of quality control of the project (SisRNC; SisSolda; SGP).
(B) Degree of understanding that the project manager should have in planning systems applied in the project (Primavera; Contract Manager; SGP; SisMatSisCon;)
(C) level of technical expertise necessary to a projects manager in relation to the interpretation of documents and understanding of the technical requirements of quality control.
(D) Level of technical expertise necessary to a projects manager in relation to understanding the contractual requirements of quality control.
(E) Necessary technical competency to a projects manager in relation to the interpretation of documents and understanding of the technical requirements of Planning.
(F) Level of technical expertise necessary to a projects manager in relation to understanding the contractual requirements of planning.
(G) Broadly speaking, it assesses the level of technical skills of project managers of Montcalm (within the areas of knowledge of PMBOK®).
(H) level of utilization of the existing repository (database of works carried out, based on documents) by the projects managers.

Figure 5: Assessment of the level of knowledge of the projects manager

Source: Elaborated by the authors

From the analysis of the figures presented, it was possible to identify the items that had higher relative index of risk to the organization.

Support areas	Support item	Relative level of Potential Risk*	Classification by level of Potential Risk
Quality	(g) After the identification of these points, quality control performs assertively the performing of actions for the structuring of the procedures, calls of counseling and development of processes to ensure that they are deployed prior to the execution of the activity itself. (G)	12.00	1st
Quality	(F) The Department of quality control analyzes critically the scope and competence to identify previously critical points within the enforcement of obligations, worthy of development of processes, procedures, and others. (F)	13.16	2nd
Quality	(e) the quality team uses the data stratified in these reports, proposing, through substantiated critical analysis, developments and plans of action in circumstances in which the target is not met. (E)	13.34	3rd
Planning	The activities related to the management and control of materials (quantities in stock, inventory, agility in the location, requests attendance responsiveness) fully satisfy the needs of the project. (H)	13.16	1st
Planning	(e) the quality team uses the data stratified in these management reports, proposing, through substantiated critical analysis, developments and plans of action in circumstances in which the target is not met. (J)	13.34	2nd
Human Resources	The HR has competency to meet the demands of recruitment and selection of the workforce, in terms of agility, quality of labor and assertiveness in my projects. (C)	13.23	1st
Human Resources	There is a full matrix support through the application of resources able to meet technically the strategic changes in goals and objectives in the course of the project. (D)	13.92	2nd

Chart 3: Items with high relative level of potential risk to the Organization

Source: Elaborated by the authors

Also, it was possible to identify the items that have the greatest potential for efficiency and operational advantage of the organization (Table 4).

Support areas	Support item	Relative level of Efficiency and Operational advantage*	Classification by level of Potential risk
Quality	The quality team is responsible for preparing reports for monitoring and control, such as the index of performance of welding, index of closure of CNR, among others, assertively and suited to the particularities of the project. (D)	17.86	1st
Quality	The control of project's RQS carried out by the department of quality meets fully the demands and needs of the project. (H)	17.55	2nd
Quality	There is support in terms of leadership in quality, with the provision of management and strategic knowledge, which clearly are aligned with the goals of the project. (A)	16.56	3rd
Quality	There is the full support of the above items supplied by management of the department. (B)	16.28	4Th
Planning	The planning team has competency for the preparation of management reports, as S curve and Reports of efficiency, assertively with realistic projections adjusted to the reality of the project. (I)	18.72	1st
Planning	The project makes use of a planning sector with competence and skill to structuring and drafting of assertive schedules and histograms. (C)	17.64	2nd
Planning	There is support in terms of leadership in the planning process, with provision for management and strategic knowledge that clearly are aligned with the goals of the project. (A)	17.28	3rd
Planning	Measurements issued by the department are in line with the deadlines set and represent faithfully the scope of measurement applicable to the period. (F)	16.66	4Th

Chart 4: Items with a high potential for efficiency and operational advantage for the organization

Remarks: * The indices of risk and efficiency and operational advantage correspond to products of the degree of importance and their average score of the item of support mentioned.
Source: Elaborated by the authors

The results obtained by the research characterize a momentary picture of the perception of the projects manager. In this study, it was not

possible to identify the temporal variation of the level of maturity in processes related to the management of projects. However, there is a growing demand for systematic and more well-structured processes, due to more complex projects and higher added value that the organization has been running over the last 12 years. It was perceived that systemic weaknesses and failures of maturity can compromiser the project results.

It is verified that even the organization working fully with the recommendations of the PMBOK Guide and with a manual for operation of the project manager since 2008, the fifth level of maturity proposed by Kerzner (2007) has not been fully achieved. At this stage, the organization should continuously improve from what was learned; However, if compared to the projection, the results were recurrently inferior as the years went by, demonstrating that the increased requirement of maturity was not completely made over the period studied. Regarding the model OPM3 (PMI, 1999), the organization is between the fifth and tenth training, due to the fact of running all of them, but not fully. This work contributes specifically to the seventh training: Creating mechanisms to evaluate the competency of resources/project teams.

About the perception of project managers about the level of integration between the departments of support and project management, it was concluded that the organization has an operational structure composed of items of high importance and, at the same time, low level of systemic performance. Similarly, the opposite scenario, formed by items of high importance and high operational performance systemic also exists. From the analysis of these factors, it was possible to identify and map, in the current scenario of the company, items that have a high potential for operational advantage and others with high relative level of potential risk.

According to the scientific literature, it is necessary to pay attention to the three layers of skills: individual, team and organizational change. The combination of all of them, from the knowledge, skills and ability to solve multidisciplinary problems, it enables to lead projects effectively, running them and delivering them with high added value (Frame, 1999, mentioned by Rabechini & Pessôa, 2005; Rabechini & Pessôa, 2005). With regard to the level of influence in the areas of matrix support the organization in

the project results, it was found that certain competences mentioned would be of strong centralization and responsibility of these areas, consequently have a high level of matrix influence. In addition, it was possible to recognize points of low evaluative influence with strong centralization in projects, equally important. It was identified also competencies that, for a proper structuring, would deserve composition between the project management department and matrix areas, suggesting a participative matrix integration.

The qualitative analysis of the data suggests a strong influence of integration points or centralization of matrix responsibility in the projects results. Accordingly, it is possible to conclude that badly-structured matrix competencies within projects produce negative unfolding, such as gaps in operational performance, aggregation of risks to the project, non-compliance to the level of maturity required by the project, among others (Kerzner, 2007; PMI, 2013).

It was also found that, in the current frame, there is a great demand related to the degree of involvement in control items and systemic processes and the knowledge of them by the project managers. This high level of demand, represented by Figure 5, suggests structuring, strengthening and maintenance of managerial competence through the training plans and necessarily the improvement of processes of communication and control in the organization, arises from the learning curve for achieving excellence in project management.

5 FINAL CONSIDERATIONS

The techniques of projects management and the skills that contribute to the maturity of the organization have a strong correlation with the concepts of management and strategic positioning. An adequate structure that takes into account the extent of these topics allows the organization to develop systemic operational competencies that, in the long run, can represent real points of competitive advantage.

With respect to the objective of this study, it was possible to identify the level of skills and knowledge in project management in the areas of

matrix support and their managers. Additionally, it was possible to promote a weighting of importance of competences for the outcome of the project.

The findings of this study have the potential to assist the organization in the search for competitive advantage, considering that the management of projects is already considered a tool to support its strategy to provide total and efficient solution to the customer (Hax and Wilde, 2002). In addition, it is necessary to consider that the organization's strategy and the management of projects should be aligned and consider primarily: the selection of projects portfolio, the level of competency existent and the very concept of business (Bouer & Carvalho, 2005). With this work, it is collaborated for a performance aimed at eliminating gaps, minimizing the risks related or leveraging the items that increase potentially the operational advantage.

This study presents limitations, some of them inherent to the case study methodology; others arising from the practice, they are: (a) emphasis on perceptive aspects - the surveys consider the perception of people facing those aspects of research presented, and may result in distorted data in the face of the subjectivity of the responses; (b) limitations of sample - the questionnaire was distributed to the entire body of managers of active projects in the company, but, in spite of the scope of the collection, the sample can be described as small, taking into consideration the existing market of industrial assemblies and their professionals involved; (c) the restriction of the perception in the face of a momentary reality , disregarding evolutions or distortions of this perception over time.

Future work will be able to evaluate the influence of the level of skills and maturity in projects management in organizations from other sectors, so that it confirms the role of those that have potential risk or benefit. Another possibility would be to perform a similar survey with the functional managers, comparing the results with the perception of the projects managers.

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