

MAINTENANCE PLANNING OF AIRCRAFT IN A FUSION ENVIRONMENT: IDENTIFICATION OF METHOD OF SUCCESS

PLANEJAMENTO DE MANUTENÇÃO DE AERONAVES EM UM AMBIENTE DE FUSÃO: IDENTIFICAÇÃO DE MÉTODO DE SUCESSO

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Abstract

The proposal of this paper is to analyze the airlines maintenance planning processes in a merger environment, in order to propose a method that enables the construction of a single process. The methodology used was a case report. The competition between companies is increasing by the globalized world, consequently process management and planning become strategic for the company to remain competitive. In this globalized world is also increasingly the amount of cases of merger and acquisitions. In this context, the present paper analyzes the definition of the airline maintenance planning processes in a moment of merger, with the purpose of recommending a method that guarantees the efficiency of the unification of the processes. The result of the analysis confirms that it is possible to define a successful method for an aircraft maintenance planning processes in a merger case. The method is composed of four steps, definition of culture, involvement of top management, process mapping and process definition.

Key words: Process. Airline company. Definition.

Resumo

O presente trabalho objetiva analisar os processos de planejamento de manutenção de empresas aéreas em um ambiente de fusão, para propor um método que facilite a construção de um processo único. A metodologia usada foi relato de caso. O mercado globalizado faz com que a competição entre as empresas seja cada vez maior, dessa forma o gerenciamento de processos e o planejamento tornam-se estratégicos para que a empresa se mantenha competitiva. Nesse mercado também está cada vez mais frequente fusão e aquisição de empresas. Dentro desse contexto o presente trabalho analisa a definição dos processos de planejamento de manutenção de uma empresa aérea que vive um momento de fusão por meio de um relato de caso, com a finalidade de propor um método que garanta a eficácia da unificação dos processos. O resultado da análise mostra que é possível definir método para a definição dos processos de planejamento de manutenção de aeronaves para que esta seja uma implementação de sucesso, em um caso de fusão. O método é composto de quatro etapas, definição de cultura, envolvimento da alta gerência, mapeamento dos processos e definição dos processos.

Palavras-chave: Processos. Empresa aérea. Definição.

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1 INTRODUCTION

Increasingly it is possible to observe processes of merger or acquisition taking place in the market. Companies acquire their competitors either as growth strategies or entry strategies into new markets. According to a report published by PricewaterhouseCoopers (PwC), in 2016, 597 transactions were carried out in Brazil, of which 182 were disclosed, totaling a turnover of US \$ 37.65 billion.

In this scenario of mergers and acquisitions, companies must adapt their processes to become a single business. It is the organizational processes that define the way a company works. Process management is a competitive differential. In addition, in order to remain competitive in the future, companies will need to be organized around its non-manufacturing processes.

According to Fabro (2003), globalization allows products from anywhere in the world to compete with national products, competitive differences are no longer only quality, now a basic requirement, and they have started to challenge other areas of the company. In this scenario, maintenance plays an important role in ensuring the competitiveness of companies.

This work analyzes the definition of aircraft maintenance planning processes in a merger and acquisition environment and verifies the possibilities of methodologies applicable in these situations.

The objective of this article is to analyze the maintenance planning processes of airlines and how the fusion environment influences the planning process in order to define a method that facilitates the construction of a single process.

2 THEORETICAL BACKGROUND

The theoretical background starts with the processes

2.1 Processes

Hammer and Champy (1994) define process as a group of activities that generates a good or service, which has value for a group of clients. Process can also be defined as a workflow that has discrete tasks and sequences, clearly defined and dependent on each other, an approach derived from the rational engineering (HARRINGTON, 1991 as cited in GONÇALVES, 2000).

However, there are other process definitions that complete the definition given by Harrington, explains Gonçalves (2000). There are processes that do not have a clear flow of beginning and end. Thus, the processes were classified into five models that range from a concrete and more objective process to an abstract process, since business processes do not always consist of clearly delineated activities. The main process models are: material flow, workflow, series of steps, coordinated activities and change of state.

Besides, according to Gonçalves (2000), the use of process concepts is possible to design a descriptive model that allows a more integrated and comprehensive management vision and allows an adequate analysis of administrative and managerial processes, which are essential for the functioning of a company.

For a company to remain competitive in the future, it will be necessary for the company to stop seeing the processes only in the industrial area and to organize itself in the trone of its non-manufacturing processes. Process management is one of the reasons why Japanese companies have had competitive advantages over their North American competitors, since they have implemented process management well in advance of the others (DAVENPORT, 1994).

The knowledge of process management allows companies to have a comprehensive knowledge of all its operation, facilitating control and decision making, important points for it to remain competitive in the market.

According to Rotondaro (2010, p.78), "Process Management is a methodology that continually evaluates the performance of key business processes with the customer's vision." Process management seeks the integration of all areas and a wide involvement of all the members of the organization, which generates a product / service that is closer to the client's expectations.

Rotondaro (2010) specifies that the organization of the company in a functional way is no longer adequate for the current competitive model. For companies to continue to achieve a process of improvement appropriate to their survival in the market is necessary that their organization is around its key processes and no longer in a functional structure.

Process management implies a horizontal view of the business and a voice and customer perspective participation in all stages of execution. The operational methodology of process management is composed of the following steps:

- a) Identification of the process;
- b) Definition of the person in charge of the process;
- c) Definition of the boundaries of the process;
- d) Drawing of the flow diagram of the process;
- e) Establishment of indicators;

- f) Analysis of the unit cells;
- g) Verification of indicators; normatization;
- h) Constant improvement.

2.2 Maintenance planning

Globalization allows products from anywhere in the world to compete with national products, competitive differences are no longer just quality, today a basic requirement, and are challenged in other areas of the company. In this scenario, maintenance plays an important role in ensuring the competitiveness of companies (FABRO, 2003).

The same author also states that, in view of the importance of maintenance for the competitiveness of the company, the maintenance should be oriented to reach the goals stipulated in the strategic planning. Planning is a set of decisions, for the formulation of objectives and the courses to be followed. The most crucial aspect of planning is that it must be participatory, coordinated and integrated (CHIAVENATO; SAPIRO, 2003).

According to Fabro (2003), in order to ensure that maintenance is prominent and aligned with strategic planning, it is necessary to define its objectives and goals. This requires a maintenance plan to be drawn up. Due to its characteristics it is possible to share the concepts of production planning with maintenance planning.

Vollmann et al. (1997), state that the objective of Production Planning and Control is to meet the needs of the market and support the company's strategy. When well structured, it provides information for more efficient decision making regarding the flow of materials, better use of people and equipment and better communication with the desires of the market.

As for Fernandes and Godinho Filho (2010), Production Planning is linked to medium-term tasks, where decisions are made in advance to prevent unexpected situations. Production Control is defined as an activity responsible for coordinating, in the short term, the activities of the production system. In both situations, the decisions to be made are related to what, when and how much to produce, to buy and to deliver, and who, where and how to produce.

According to Fabro (2003), the goal of maintenance planning is to ensure greater reliability, maintainability and consequently availability to the equipment. To this end, a maintenance plan should be designed based on the criticality of the processes. The production planning activity that assists in the design of the plan is the forecast of demand.

According to Sipper and Bulfin (1997), demand forecasting is a defined method of attempting to "guess" what will happen in the future. The importance of forecasting demand has been increasing, as nowadays, good and bad rewards can have enormous impacts on companies. Forecasting methods vary according to the problem the company faces.

As it has been already mentioned, the maintenance process is increasingly important in achieving the overall goals of the organization. The maintenance process must support the activity that produces the main good or service of the company to achieve its objectives, that is, it must be adapted to its needs (FABRO, 2003). So we have that maintenance planning is an important step for the company to maintain its levels of competitiveness in the market.

2.3 Merger and acquisitions

Merger and Acquisition (M & A) is the strategy that allows the expansion in new markets, which allows growth through a combination of two companies. Companies adopt the M & A strategy as a way to approach the market that was previously not possible, and thus seek to increase or improve their business.

Competitive strategy is to create an exclusive and valuable position, involving a different set of activities. Choosing different activities from other competitors is the essence of strategic positioning. Mergers and acquisitions may be part of the competitive strategy of some companies (Porter, 1998).

In the merger process the companies combine by means of a permutation of actions and create a new company. In the acquisition process, only one company maintains its identity, since a purchase process is carried out by the other party involved (CAMARGOS, 2005).

The same author reports that the motives of mergers and acquisitions are based on two theories of firms, the first is the Neoclassical Theory of Maximization of Firm Profits and the second Theory of Maximization of Managerial Utility.

Wood Junior (2004) states that mergers and acquisitions are among the most relevant and dramatic forms of organizational change. However, this process often becomes traumatic and destroys value, due to a failure of understanding in the post-F & A integration process (WOOD JR., 2004).

The same author points out that the way the merger and acquisition process is conducted determines the impact on the outcome. Companies with the best results in terms of impact generated were companies that presented a less coercive M & E process, with better communication, fewer layoffs, more respect for employees and better carried out integration activities.

According to a study conducted by Ukon (2017), the managers interviewed pointed out three key factors for a successful transaction. Preparation for transaction, proximity to the vendor and senior involvement in the integration process.

By separating in phases of the acquisition process, the main risk and success factors were identified in three stages, before the transaction, execution and post acquisition

- a) Before the transaction: preparation was the main factor pointed out by the managers, not only to identify the risks, but also not to neglect value creation opportunities;
- b) Execution: creating a closeness with the seller, not only in cases where the seller remains as a shareholder, is pointed out as an essential factor. Lack of proximity can lead to even inconsistent information acquisition, which can lead to strategic errors;
- c) Post-acquisition: the integration of companies and the proper implementation of the strategic plan are determining factors for the success of the investment. The integration of cultures is seen as the critical factor, monitoring the organizational climate and ensuring transparent communication with employees, quickly identifying and integrating the acquired company's talents while still implementing the buyer's essential culture, are pointed out as essential points.

The degree of application of a very simplified approach, or a misrepresentation of reductionism, is one of the factors that explains the difference between the success and failure of an M & A process. Many companies or even consultancies involved in the process tend to fall victim to the tendency to simplify processes (WOOD JR., 2004).

Merger and acquisitions is a complex process and one that requires a skill in driving as well as depends on taking a correct perspective. Taking a reductionist perspective is the first step towards disaster. Wood Jr. (2004) argues that for the process to succeed, it is important to take the right perspective as the first step.

3 METHOD

Besides reaching its objectives, a scientific work seeks to have a well organized structure, to allow a better understanding by other researchers who may use this work for the development of new researches. Currently, according to Miguel (2010), the importance of the research methodology, which offers authors the opportunity to give their work the appropriate scientific character, becomes perceptible.

A feature that needs to be defined for the search is linked to the goals it seeks. For this attribute, three approaches will be presented. The first one, of an exploratory nature, aims at a greater contact with the object of study for the construction of new hypotheses on the subject. The second, descriptive character, aims to describe the characteristics of the object of study. The third, the explanatory character, besides the analysis of phenomena, aims at the identification of the variables that influence the studied problem, seeking, thus, the deepening of the knowledge of the area (ANDRADE, 2002).

Marcondes et al. (2017) state that in the approach about the objective of the research, this work qualifies as an applied research towards the decision, since it is not interventionist and its nature is supplementary, once it presents recommendations and information.

The research structure is divided into six phases:

- a) Understanding of the opportunity;
- b) Elaboration of the research project;
- c) Fieldwork;
- d) Treatment and analysis of data;
- e) Conclusion of the research;
- f) Final evaluation of the project.

Regarding the characterization of the research method, this work will be developed through a case report. Since, according to Yoshida (2007), the case report is a more simplified form of scientific presentation. The basic structure of the case report includes title, abstract, an introduction with purpose, case description, technique or situation, a discussion with literature review and conclusion. It can also be classified as qualitative in relation to the method, this method comprises the collection and treatment and analysis of data (MARCONDES et al, 2017).

4 RESULTS AND DISCUSSION

Results and discussion start with the company

4.1 The company

The company in which the study was carried out (here named Alfa) is an airline with operations in more than seven countries and one of the market leaders in the country of origin. A company that differentiates itself by the quality of customer service.

Alfa has 33% of the market in passenger-kilometers transported, while its largest competitor owns 38% of this market.

In 2012 the company went through a merger process, becoming the largest airline in Latin America. After this process the company now has 27 international destinations and 108 destinations in the countries where it operates.

In addition to the destinations in which the company operates, it is also part of one of the largest alliances among airlines in the world composed of 13 other companies, which brings the number of airports served to 1016 in 160 different countries.

In 2017 the company Alfa changed its organizational structure, with the purpose of simplifying and facilitating the processes. The restructuring is based on four major areas that will be subordinated directly to the CEO, customer area, operations and fleet, commercial and finance.

The unit in which the case report was made was the aircraft maintenance planning. The maintenance of aircraft has a strategic role in the organization, serving as a support to the business, since the control of aircraft maintenance is subject to national or international regulatory bodies, it is not a simple task and, any failure, can result in incalculable impacts to society.

The central maintenance planning (CMP) is the area responsible for determining when, where, how and by whom the preventive and corrective maintenance of each aircraft should be performed. To carry out maintenance planning, the CMP is organized as follows, one manager, two coordinators, three supervisors and twenty-nine analysts.

The Alfa company has 140 aircraft among the models Airbus A319, Airbus A320, Airbus A321, Airbus A350, Boeing 767 and Boeing 777. These aircraft are used for both domestic and international routes. CMP is responsible for planning and scheduling short, medium and long term preventive maintenance as well as corrective maintenance.

To carry out the planning and programming of maintenance, the company resorts to a network of eight maintenance bases and approximately 430 aircraft maintenance mechanics.

Preventive maintenance is determined by the manufacturer's manual and must be carried out within the stipulated period. As for corrective maintenance, there is a manual that determines the maximum period for the execution of the task. The deadlines for carrying out the maintenance are controlled by the regulatory agencies of each country. Thus a premise for the Alfa company to continue operating in the country is to keep the maintenance up to date as well as the records of its execution.

The purpose of central maintenance planning is to ensure the execution of maintenance tasks efficiently, that is, complying with legislation and spending the least possible financial value.

4.2 The situation analysis

The maintenance central planning of the unit of study is responsible for the control of the aircraft operating in the study company, that is, all control, planning and maintenance scheduling of the Alfa company was under the responsibility of the CMP analyzed in this case report.

As it has already been mentioned, the Alfa company went through a merger process in 2012, becoming part of a group. After the merger the company Alfa restructured its organization form, creating a matrix structure to which the units belonging to the group started to report. In this way the CMP started to have another reporting hierarchy.

The maintenance matrix structure has now two major areas responsible for aircraft maintenance control, planning and scheduling, one being the unit of study and the other the unit of the company that merged with the Alfa company. Each unit had a distinct maintenance planning process and process, as well as completely unique control systems.

For the first two years, the maintenance planning processes were maintained, that is, the merger process had nothing to do with the maintenance planning industry.

At Alfa, the maintenance planning process was structured as follows: long-term planning, medium-term planning, and short-term planning. Long-term planning is responsible for designing maintenance schedule schedules along with the network planning team, determining resource requirements, and maintaining a database with information related to maintenance tasks. Medium-term planning is responsible for designing the maintenance strategy to ensure that the necessary resources are available within the timeframe and at the locations determined for performing the maintenance tasks and for feeding back the database. Short-term planning is responsible for ensuring the scheduling of tasks close to the execution date, and for contingencies related to maintenance scheduling.

In order to determine the strategy for scheduling the aircraft maintenance preventive tasks, Alfa works with the scheduling interval method based on the task repetition interval. That is, a planned execution date for the task was drawn based on the size of the range, the planned date is 10% of the size of the interval as long as it is less than 60 days and greater than 10 days. For example, if a maintenance task is to be performed every 300 days, the planned date will be 30 days before the task expires.

In terms of task prioritization strategy, the risk concept was used, that is, the time interval between the planned date and the due date of the task, the closer to the expiration the greater the risk of non-execution of the task before its legal maturity. If the task is not performed until its expiration, the aircraft is prevented from performing flights, impacting on the availability of aircraft to guarantee the company's flights. To determine the risk, high, medium and low bands were created, facilitating the decision making in the prioritization of tasks.

To control the tasks that must be carried out and their execution, the company Alfa had a system specially developed for its needs. In this system it was possible to find the information of each aircraft and its maintenance tasks, both preventive and corrective.

It is also the responsibility of the central maintenance planning to have an interface with the supply chain team in order to guarantee the availability of the materials needed to perform each maintenance task. For this, CMP uses an internally developed Excel tool to inform the supply chain team of the need for materials in a given period.

In 2014 the period of merger of maintenance planning processes began. The company Alfa underwent a process of changing the way of working and the tools used to carry out maintenance planning. The top management of central maintenance planning was not involved in any of the change processes the area was going through, in fact top management acted as detractor of the whole process, critically destructive of all changes, which resulted in the fall confidence of employees and generated greater resistance to any implementation that would come.

The first stage of change was the integration of systems that control maintenance tasks. For this, a project team was created to implement this new tool in the company Alfa. It was a multidisciplinary team that had as objective to implement a robust tool that would replace more of a tool used by the Alfa company.

At that time, the maintenance planning processes would not be changed in any of the companies, it would only be a change of control system. A system was presented that would integrate information on aircraft maintenance tasks as well as information on the availability of materials and tools needed to perform the tasks, thus facilitating Alfa company processes.

During the transition phase of the systems it was identified that it would not be possible to implement the material and tool control functionality of the maintenance system. The implementation of the system was delayed more than once in an attempt to contemplate all the functionalities, but the partial implementation of the system was decided. That is, it would be necessary to maintain the parallel control systems used to guarantee the functionalities that did not contemplate the system already existing in the Alfa company. This change affected the trust of the CMP team, employees did not believe the system would be implemented and would not bring benefits to the maintenance planning process.

In 2015, the company's culture transition began due to the merger process, the company's new mission, vision and values were designed. Thus, the CMP collaborators went through two simultaneous changes, the change of planning process and change of mentality and cultural behavior. This simultaneous change meant that, to CMP employees, any of the objectives of this process were clear.

In the second half of 2015, the implementation process of the maintenance control system began. The process involved the definition of leading project collaborators, visits to the company that already used the system to understand in loco and training of all employees in the new system. The training was done in the classroom during different periods of the work period and with an evaluation in the end.

The implementation of the maintenance system was divided into two phases, the first phase being the inclusion of wide body aircraft, which represents 10% of the company's total aircraft, and then the inclusion of narrow body aircraft. In October of 2015 the transition of the first aircraft to the new control system was made, it was a re-learning period, since more than a month had passed between training and implementation.

During the first phase of implementation there were many difficulties related to the use of the system, besides divergences of information. The CMP team was not prepared to work with two different operating systems. There was enough resistance from the employees, the learning period was longer than the one designed by the project team.

Due to the difficulties encountered in the first phase of implementation, the second phase was postponed and a working front was initiated between the CMP and the project team to implement the new system, which had not previously existed. A disaster mitigation plan was developed, based on the problems encountered in the first phase, this plan was monitored weekly to ensure that the actions were implemented and that the new phase two implementation date could be fulfilled.

In the beginning of 2016, the brand change campaign was announced, where the group that the Alfa company was inserted in would become a single company with a single purpose. As already mentioned in this chapter, mission and values had already undergone a transformation, now it was a change both internally and externally. The entire process of change was developed by a corporate airline and depended on each area manager to encourage favorable behavior towards the new company that was emerging. In the PCM there was little participation of the management and the employees' perception regarding the cultural change that was initiated was low, they were not engaged in the creation of a new company.

After the change of the brand and the cultural change implemented, the second phase of the system transition process began, the most critical phase of the entire process. The challenge was immense, but it was less traumatic than the first one since the major gaps were identified in the first phase. However, the divergence in the way of working between the units that make up the analyzed company became more evident.

The system unification process was the first step in the standardization of the aircraft maintenance planning processes between the two units, but the changes that were necessary for the implementation in the Alfa company distanced the unification of the processes. Even today, a complete standardization of the maintenance planning process has not been done.

4.3 Analysis of the case report

Returning to the concept of processes, Hammer (1994) informs that process is a group of activities that generates a good or service. Thus, the sequence of activities that make up the maintenance planning determines its process. The methodology used by CMP to determine when, where, how, who and what to do with each maintenance task is what determines the maintenance planning process.

As mentioned earlier in this paper, the knowledge of process management allows the company to be aware of its functionality and facilitates control and decision making so that the company remains competitive in the market. Hence the importance of standardization of processes between maintenance planning units.

The Alfa company began the process of maintenance through the standardization of control systems of maintenance tasks. However, it began before the change of culture, which was implemented after the first phase of transition. This impaired the engagement of CMP employees in the project, the purpose was not clear to everyone. According to research done by BCG in 2017, managers point out as a cause of success in merger processes is the definition of the values of the company formed by this process.

Despite the fact that the process started earlier than the literature suggests, the standardization process focused only on the implementation of the system, leaving aside maintenance planning activities. This led to a lack of control of the maintenance tasks, that is, the definition of when to do was left aside for the unification of the systems. The result of this action was the increase in the cost of maintenance, since the opportunities of execution were not used and it was necessary to request a stop of the aircraft. In addition, non-planning when performing a task impacts on stock control of parts, which makes the maintenance process more expensive.

In the bibliographic review of this work it was pointed out that more and more the maintenance process is important to reach the global objectives of the organization. Particularly for the civil aviation industry, the maintenance process is an important step for the company to remain competitive since maintenance costs represent the largest share of an aviation company's costs shortly after the fuel costs. The Brazilian Association of Airline Companies (ABEAR) surveyed the costs of airlines between 2002 and 2015, during which time more than 60% of an airline's costs were comprised of leasing, maintenance and insurance of aircraft, fuel, indirect costs and depreciation of flight equipment.

It is possible to observe that the Alfa company did not rely on the theories available to design and design the standardization of the maintenance planning process. It is also possible to identify that this standardization was not successful in the short term, once this process started in the CMP in 2015 is still in progress. Besides, there was a setback in the maintenance planning process at the Alfa company since there was an increase in maintenance costs.

One of the biggest difficulties encountered was the acceptance of a new way of working, a new culture, the high management of central maintenance planning did not get involved with the process is criticizes the changes in a destructive way. This behavior directly impacted the employees' confidence in relation to the whole process of change they were going through.

The company has adopted a reductionist way of unifying and standardizing the maintenance planning processes. As presented by Wood Jr, (2004), taking a reductionist stance is the first step to the failure of the operation. Even today the Alfa company is reaping the results of poor standardization of processes and procedures.

5 CONCLUSION

The objective of this research was to analyze aircraft maintenance planning processes and propose a method that facilitates the construction of a single process in a fusion scenario.

The theoretical background of this present work shows that there is a methodology for the unification and processes after the merger of two or more companies. The main points raised by theorists are the creation of a single culture, the involvement of senior management throughout the process and avoid a reductionist approach.

The case report shows that the Alfa company did not adhere to any of the theories presented, and even after three years of the beginning of the unification of the maintenance planning processes, it was not possible to finalize the consolidation so that the company worked in a unique way. Thus, it is possible to conclude that the key points raised are really decisive for the process to be efficient and to achieve positive results for the company.

In this way it is possible to identify a method for the definition of aircraft maintenance planning process in the event of a merger. The first step of the method is the definition and implementation of a single corporate culture so that everyone has the same goal as a company. The second step is to ensure the involvement of senior management, with the involvement of senior management the importance of the process is perceived by all. The third step is to identify the current processes and map all steps avoiding simplification. The fourth step is to start defining the processes that will be part of the new company formed after the merger.

Theories emphasize that the first step is the implementation of a single culture, but changing or unifying an organizational culture is not a simple process or a quick process. In this way, it is not always possible to guarantee that the first step is executed before starting or the second step, so to ensure a good result it is important to ensure that the other steps are followed.

The present work reaches the objective of defining a method that facilitates the construction of a single process in a fusion scenario through the presentation of the case report. In view of this, it was possible to define a methodology for the definition of aircraft maintenance planning processes.

It is possible to conclude that, for the definition of processes to be effective, it is necessary to follow the methodology of work, even if adapted to the reality of the moment in which the company is located. Otherwise, the company will not achieve its goal in an efficient and timely manner.

6 REFERENCES

- ABEAR. **Panorama da aviação brasileira.** Retrieved from: < <http://panorama.abear.com.br/dados-e-estatisticas/custos-das-empresas> >. Accessed in: 02 Oct. 2017.
- ANDRADE, M. M. **Como preparar trabalhos para cursos de pós-graduação: noções práticas.** São Paulo: Atlas, 2002.
- CAMARGOS, M.A. **Análise empírica da hipótese de maximização da riqueza dos acionistas nos processos de fusão e aquisição, ocorridos no mercado de capitais brasileiro pós-plano real.** Revista Gestão USP, São Paulo, v. 12, n. 4, p. 33-53, Out/Dez 2005.
- CHIAVENATO, I; SAPIRO, A. **Planejamento estratégico: Fundamentos e aplicações.** Rio de Janeiro: Elsevier, 2003.
- CONTADOR, José Celso. **Gestão de operações: a engenharia de produção a serviço da modernização da empresa.** São Paulo, Blucher, 2010.
- DAVENPORT, T. H. **Reengenharia de processos.** Rio de Janeiro: Campus, 1994.
- FERNANDES, F.C.F.; GODINHO FILHO, M. **Planejamento e Controle da Produção: Dos fundamentos ao essencial.** São Paulo, Atlas, 2010.
- FABRO, Elton. **Modelo para Planejamento de Manutenção Baseado em Indicadores de Criticidade de Processo.** 99f. Dissertação (Mestrado em Engenharia de Produção). Programa de Pós-Graduação em Engenharia de Produção, UFSC, Florianópolis, 2003.
- GONÇALVES, J. E. L. **As empresas são grandes coleções de processos.** Revista de Administração de Empresas, São Paulo, v. 40, n. 1, p. 06-19, Jan/Mar 2000.
- MARCONDES, R. C. [et al.]. **Metodologia para trabalhos práticos e aplicados** [livro eletrônico]: Administração e contabilidade. São Paulo: Editora Mackenzie, 2017.
- MIGUEL, P. A. C. (organizador). **Metodologia de pesquisa em engenharia de produção e gestão de operações.** Rio de Janeiro: Elsevier, 2010.
- PORTER, M. **Competição: Estratégias Competitivas Essenciais.** Rio de Janeiro, Elsevier, 1998.
- PWC. **Fusões e aquisições no Brasil: dezembro 2016.** São Paulo, 2016. Retrieved from: < <http://www.pwc.com.br/pt/publicacoes/servicos/assets/fusoes-aquisicoes/2016/pwc-fusoes-aquisicoes-dezembro-2016.pdf> > Accessed in 13.May.2017.
- SIPPER, D.; BULFIN JR, R.L. **Production planning, control and integration.** New York: McGraw-Hill, 1997.
- UKON, M.; LE CORRE, J.; AYRES, M.; JORGE, P. **Made in Brazil: análise da geração de valor em duas décadas de fusões e aquisições no Brasil.** São Paulo, 2017. Retrieved from: < http://image-src.bcg.com/Images/M-A-Made-In-Brazil_tcm15-170565.pdf > Accessed in 15. Sep.2017.
- VOLLMANN, T.E.; BERRY, W.L.; WHYBARK, D.C. **Manufacturing Planning and Control Systems.** New York: McGraw-Hill, 1997.
- WOOD JUNIOR, Thomaz; VASCONCELOS, Flávio C.; CALDAS, Miguel P.. **Fusões e aquisições no Brasil.** GV-executivo, [S.l.], v. 2, n. 4, p. 41-45, out. 2004. ISSN 1806-8979.

Retrieved from: <<http://bibliotecadigital.fgv.br/ojs/index.php/gvexecutivo/article/view/34989/33767>>. Retrieved in 27 Aug. 2017.

YOSHIDA, W.B. **Redação do relato de caso.** J Vasc Bras, São Paulo, v. 6, n. 2, p. 112- 113, 2007.