

Management and Mapping of Processes: A Case Study in a Federal Autarchy

Antonio Raimundo Amorin da Silva, Gabriela de Mattos Veroneze, Marcelo Albuquerque de Oliveira,
and Jordania Louse Silva Alves

ABSTRACT

This research aims to analyze a process management model with the purpose of improving organizational efficiency in a Human Resources Sector of a Federal Autarchy. The methodology uses the BPMN (Business Process Modeling Notation) and the Bizagi Modeler. The goal is to obtain process models through BPM (Business Process Management) using PDCA, an effective tool for solving problems whose methodology is a simple way to plan, put into practice, control, and act on failures, and can be used for maintenance and improvement of the control guidelines of a process. This study can be classified as applied research, in terms of nature, exploratory in terms of its objectives, quantitative in terms of its approach. As a result, the modeling of three processes was done and used as a reference for future studies in the same sector. The results were satisfactory, and some improvements should be implemented.

Keywords: Administration; Improvement; BPM; Management; Public Process Mapping.

Submitted : June 28, 2022

Published : July 31, 2022

ISSN: 2507-1076

DOI: 10.24018/ejbmr.2022.7.4.1534

A. R. A. da Silva

Universidade Federal do Amazonas,
Brazil.

(e-mail: amhorin@gmail.com)

G. de M. Veroneze*

Universidade Federal do Amazonas,
Brazil.

(e-mail: gveroneze@ufam.edu.br)

M. A. de Oliveira

Universidade Federal do Amazonas,
Brazil.

(e-mail: maoliveira@ufam.edu.br)

J. L. S. Alves

Universidade Federal do Amazonas,
Brazil.

(e-mail: jordania@ufam.edu.br)

*Corresponding Author

I. INTRODUCTION

The public sector in Brazil has a management practice based on structures with excessive hierarchical levels and departments, strong political influence in decision-making and an organizational culture of resistance to change, generating administrative slowness. Several departments of the same institution do not have formalized procedures to facilitate their daily activities. Consequently, they become dependent on the knowledge acquired by the server (civil server) responsible for the execution of the task, which ends up becoming the holder of all the expertise of the process (Santana, 2015).

With the socioeconomic phenomenon of globalization and the growing changes in the management of organizations, the search for better service to its users is crucial, and to accompany such transformations, these organizations must modernize and improve their routines. This study is based on the difficulties generated by the lack of procedures in processes inside the federal autarchy (Souza, 2016; De Oliveira & Grohmann, 2016).

The Public Administration should seek to improve the provision of public services, improving the quality of services, with savings, cutting unnecessary flows, creating standard forms, measuring processes, defining deadlines for sending and receiving documents between sectors, maintaining long live the memory of the organization (Souza, 2016). Thus, this work seeks to improve efficiency in the

administrative management of a Human Resources of a Federal Authority through a proposed model of management and processes improvements.

Within the scope of the autarchy under analysis, the aforementioned HR sector presents a considerable volume of processes that need specific treatment and that often have their efficiency compromised due to the lack of procedures and standardization that could present faster solutions with attention to each peculiarity and to each demand.

This research is relevant, since the proposal can support managers in decision making, contributing to the search for results and the definition of a single and standardized language in the management of processes. Process mapping gains importance due to its function of recording and historical documentation of the organization, since learning is built on the basis of transmitted knowledge and experiences (Villela, 2000).

Based on this research the elaboration of a process management methodology is contemplated and thus it is expected improvement in the organizational performance.

II. LITERATURE BACKGROUND

A. Process Management

Pradella *et al.* (2016) summarizes process management as the systemic approach of designing and continuously improving organizational processes, by empowering people

and working as a team, combining technological and emerging capabilities, aiming at delivering values to the customer. Process management, for (Paim, O que são BPMS: Sistemas de Suporte as Tarefas para Gestão de Processos, 2007) continuous improvement through knowledge and documentation of each activity at work, and serves to document, develop, implement, monitor, and optimize, integrating systems and people. In the view of Paim *et al.* (2009) it is an articulated set of permanent tasks to design and promote the functioning and learning of processes (Melo & Monteiro, 2020). Gaining full understanding of the current state of a process is the first step in updating or even establishing a new method. Analyzing a process is studying the various factors that influence it, such as the work environment, customer needs, and how the process was developed to achieve the organization's goals. This investigation serves to represent how the process is actually happening, impartially, without attributing responsibility for existing inefficiencies (Damasceno & Pontarolo, 2018). It is a central responsibility of managers to seek optimization and to do more with fewer resources and encompasses from the highest decision-making level to the simplest executive level, emphasizing the importance of managing the work routine, centered on: perfect definition of authority and responsibility for each person; in the standardization of processes and work; in monitoring the results of these processes and comparing them with the goals; in the corrective action in the process from the deviations found in the results when compared to the goals; in a good working environment and in the maximum use of people's mental potential (Pereira *et al.*, 2017; Costa & Moreira, 2018) for process management to generate the expected results, it is necessary that the corporate environment is favorable and its global structure is oriented to interconnect other administrative instruments, such as: strategic planning, organizational structure, total quality, logistics, management reports, employee participation and commitment system. Process management provides participants, decision makers and stakeholders with information about the efficiency and effectiveness of organizational processes. There are three reasons why you want to measure different aspects of business processes: to assess what has happened in the past, to understand what is happening now, or to develop an understanding of what might happen in the future (Rosa, 2020).

B. Process Modeling

Process modeling can be understood as the act of drawing the organization's processes/activities through a workflow. This flow aims to present the organization's processes/activities graphically through a workflow. This flow aims to present the organization's processes in the current format, called "AS IS", so that managers and people in charge know the state of the organization and can work on improvements, thus creating future processes, called TO BE. In this context, BPM (Business Process Management) is characterized as a set of methods, techniques and tools that aim to discover, analyze, redesign, apply and monitor business processes, aiming to reduce costs and increase corporate performance (Zarour *et al.*, 2019). Costa and Moreira (2018) indicated as possible benefits the agility, reduction of errors, dynamization and standardization of the

processes, a subsidy for orientation of new servers and the possibility to work the risks of the processes. In addition, the authors listed recommendations for the implementation of BPM, such as the following factors: creating a team to coordinate the implementation, enabling the sector team, monitor the implementation process, create indicators to evaluate the implementation results. BPMN (Business Process Model and Notation) is an ISO standard notation designed for process mapping, providing a common language for different business activities (Corradini *et al.*, 2018). This process modeling technique provides companies with the ability to understand their internal procedures through a graphical representation and gives these organizations the possibility to communicate these procedures in a standardized form (BPMN, 2018).

C. Process Mapping

Costa and Moreira (2018) list the main stages of process mapping: a) determining the process and the tool to be used, b) delimiting its beginning and end, c) delimiting its inputs and outputs, d) determining the level of detail, e) verification and validation of the map. highlight that the mapping makes it possible to identify the interfaces between multiple sectors, internal and external customers (Caramuta, 2021) inputs and outputs delivered. There is also the possibility of visualizing the processes that are part of the current workflow and identifying if there is any critical point that could compromise the performance of the entire organizational system. Once these critical points are identified, efforts can be directed to correct or even eliminate them, avoiding unnecessary costs and delays in the cycle time of services and products. BPMN (BPMN, 2018) is an ISO standard designed for process mapping, providing a common language for different business activities (Villela, 2000). This technique provides companies with the ability to understand their internal procedures through a graphical representation and gives these organizations the possibility to communicate these procedures in a standardized format. (BPMN, 2018).

D. PDCA

BPM literature contemplates several life cycles of business processes that approach management in a continuous cycle. However, regardless of labels or number of phases, most life cycles can be fully mapped as a basic PDCA cycle (Isniah, *et al.*, 2020). The PDCA or Deming Cycle is one of the tools most used by Human resources professionals to manage and monitor the improvement of production processes. It is a technique that demonstrates an efficient control of activities and that standardizes actions and minimizes errors during management, favoring positive changes, simplifying management, and promoting the best strategies (Schmidt, 2019). Its objective is to promote the continuous improvement of processes through a circuit of four actions: plan, do, check and act. The aim is to help understand not only how a problem arises, but also how it should be solved, focusing on the cause and not the consequences (Alves *et al.*, 2020). This process modeling techniques provides companies with the ability to understand their internal procedures through a graphical representation and gives these organizations the possibility to communicate these procedures in a standardized format (BPMN, 2018).

III. CASE STUDY

The study was developed in the Human Resources Sector of a federal agency in the city of Manaus/AM. The main motivation for carrying out this study was the lack of standardization in the creation, operation, and processing of processes, generating several operationalization routines, with subsequent returns for corrections or inclusion of documents that had not been included at the beginning. This situation created divergent understandings on the same subject and made it possible to adopt contradictory opinions at certain times. The knowledge ended up being in the power of the older servers that were always, activated to help the servers that had just joined the unit.

In relation to nature, this study can be classified as applied research, since it is aimed at the acquisition of knowledge with a view to application in a specific situation (the context of improving processes in the human resources sector), without leaving, to contribute to the expansion of the scientific knowledge to which it is related. As for its objectives, this research is exploratory, as it seeks the theoretical-practical improvement of systems, products, or processes. As for its approach, it is qualitative, as it seeks to understand a social phenomenon, analyze specific data, describe the complexity of the organization, compare variables, enable a greater understanding of particularities, and contribute to the organization's management process.

To conduct the present research, the case study method proves to be the most appropriate. The case study is precisely an empirical questioning for understanding a contemporary phenomenon with its real-life contexts, applicable exactly when the boundaries between phenomenon and context are not fully clarified and in which multiple sources of information are used. evidence.

The need to standardize the processes, taking advantage of all the knowledge and experience accumulated by the servers and considering the large number of activities developed in the Human Registry Sector, the proposal of this case study was to use these tools to map some of the most complex processes of this unit based on the opinion of the team. In the first phase of the research, data collection was carried out through the application of questionnaires designed with the objective of knowing the vision of the process operators.

The HR sector of this autarchy has a staff formed by servants of various positions such as: Administrator, Social Worker, Dentist, Accountant, Analyst, Occupational Safety Technician, Accounting Technician, Administrative Agent and two team coordinators. Through the answers, it was possible to infer that the main problem found was the absence of work instructions and a unique understanding of the application of personnel legislation. An important point to be highlighted is that 100% of the respondent's declared knowledge about Process Management and Mapping, and its importance for the visualization of the flow and the execution of activities.

The greatest expectation would be regarding the significant reduction of errors and, consequently, the dynamization of these processes. Another positive point extracted from the responses was the facilitation of knowledge of the flowchart for the new servers, who would use the tools, obtaining information in a more transparent way without the

participation of intermediaries to sell their ideas and their vision of the functioning of the processes. Each respondent classified as critical those processes related to their area of activity, with few similar opinions, which showed that the problem was not in specific processes, but in the way, processes are managed with the absence of mapping and identification of bottlenecks.

After a careful verification of the processes that passed through the Electronic Information System – SEI!, three different types of processes were selected for the mapping, whose analysis will serve as a basis for the identification of bottlenecks and critical points.

The processes of Retirement, License for Training and Leave for *Stricto Sensu* Post-Graduation presented a considerable volume of return to the applicant, or to the previous sector and document rectification. As these processes did not have the modeling of their flow, it was necessary that the modeling was carried out following the route shown in others of the same type, until the design was found that faithfully represented what was intended to be achieved in meeting each demand and was validated. by the agents responsible for each process.

After choosing the processes that would serve as the basis for this study, the modeling was started using the BPMN notation (Business Process Model and Notation) because it is easy to understand and easy to execute, with the ability to work with processes of any complexity. The BizAgi Process Modeler application supports BPMN notation and can be downloaded for free, in addition to being available in Portuguese. It also has an intuitive interface and allows publishing in Word, PDF, Excel, Web, and Wiki. The use of this tool made it possible to document the entire flow of each process, generating a report to be used as a work instruction or basis for replicating this activity. After applying the questionnaires and collecting the information available in the processes of the SEI! system, it was possible to simulate a flow where each step was described and the person responsible for that activity was presented. The result can be seen in the tables and figures in the following section.

IV. RESULTS AND DISCUSSION

As the process mapping had not been carried out in this sector, the focus was not on “drying down” the flow, but on creating a standard to be followed by the agents. The absence of mapping ended up causing each operator to create their own itinerary, leaving each process with different designs, which hindered the newly joined agent when it came to fulfilling the steps of a certain demand. The diagram with the proposed final design, using the BPMN notation, clearly presented how the flow of the steps of each process would be from the origin, with the possibility of improvements from the observation over time, as new ones appear. bottlenecks. With the use of Process Mapping, it was possible to know the tasks that are part of each stage and how each responsible sector acts in relation to the demands of the other sectors.

A. *Process License for Stricto Sensu Graduate Studies*

It is the process in which the civil servant requests to leave to study a master's doctorate in a city other than his/her city of employment, without prejudice to their salary, meaning

that the employee is going to keep its salary while going out for postgraduate study.

The applicant initiates the process by attaching the required documents. HR verifies that the documentation is correct and forwards it to the Evaluation Committee. The Evaluation Committee consults the Internal Affairs Office regarding the existence of impediment. The Evaluation Committee consults the HR regarding the legality of the act. It then prepares an opinion and a draft ordinance forwarding it to HR for consideration by the Superintendence. Superintendence forwards ordinance for publication. After publication, HR makes entries in the SIAPE system and archives the process.

B. Process License for Short Time Study

It is the process in which the server requests leave for professional training for up to three months, maintaining the remuneration.

The applicant initiates the process by attaching the required documents. HR verifies that the documentation is correct, issues an opinion on the development action, attaches

functional documents, and issues an opinion on the legality of the act and prepares a draft ordinance to be sent to the Superintendent. The Superintendent sends an ordinance for publication. HR makes entries in the SIAPE system and archives the process.

C. Retirement Process

It is the process in which the server requests retirement, after meeting the minimum requirements required by the legal norm.

The applicant initiates the process by attaching the required documents. HR verifies that the documentation is correct, attaches functional data and forwards a query to the Internal Affairs Office regarding the existence of an impediment. The HR prepares an opinion on the legality of the act, issues a declaration and ordinance to be published by the logistics sector. It provides an opinion on the legality of the act and prepares a draft ordinance to be sent to the Superintendent. The Superintendent sends an ordinance for publication. HR makes entries in the SIAPE system and archives the process.

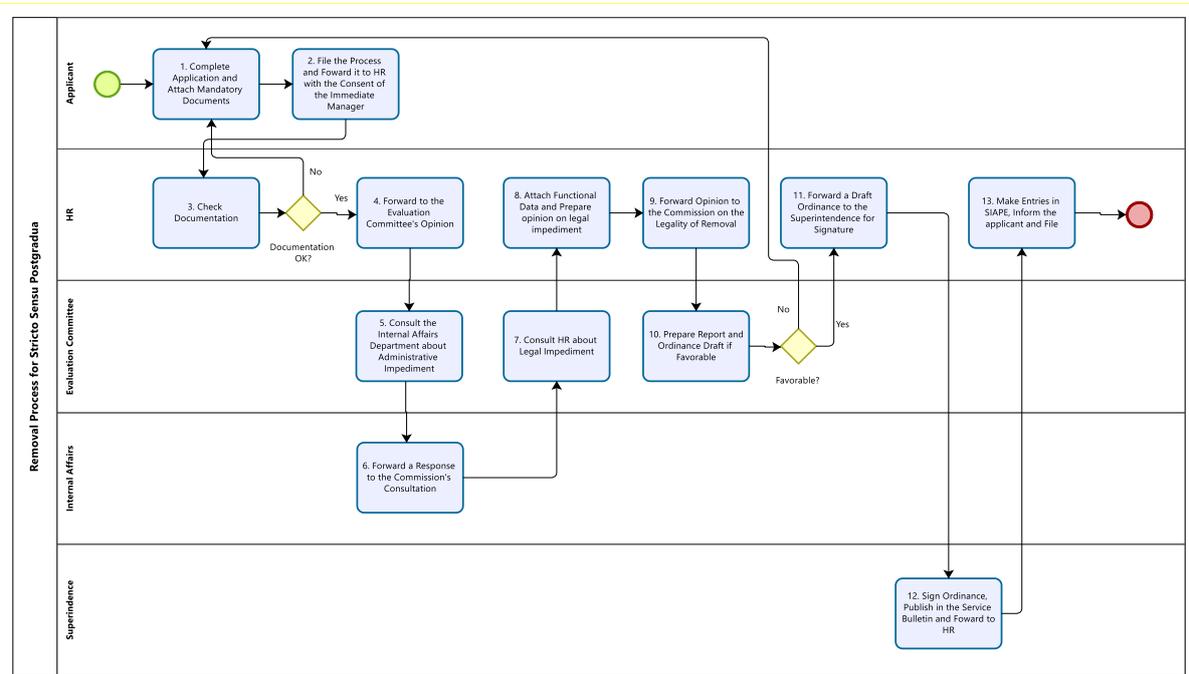


Fig. 1. Removal Process.

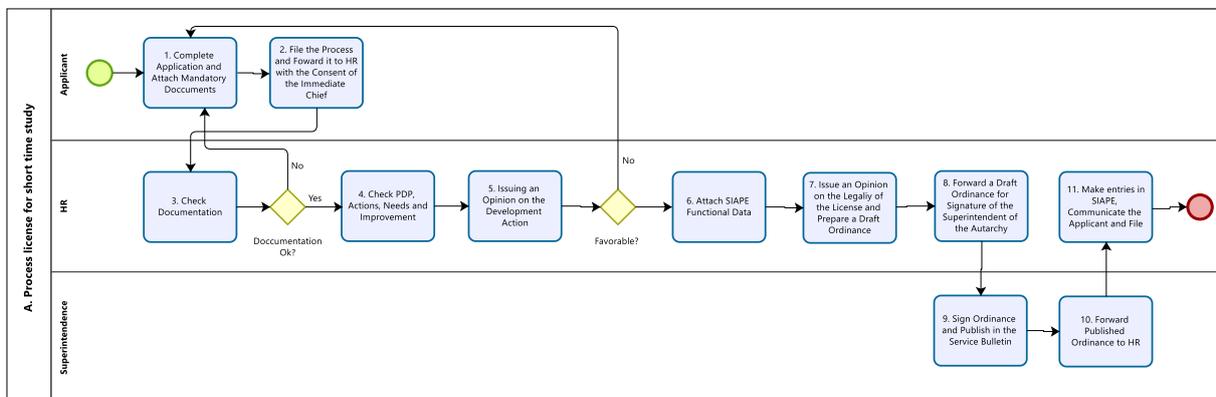


Fig 2. Process license for short time study.

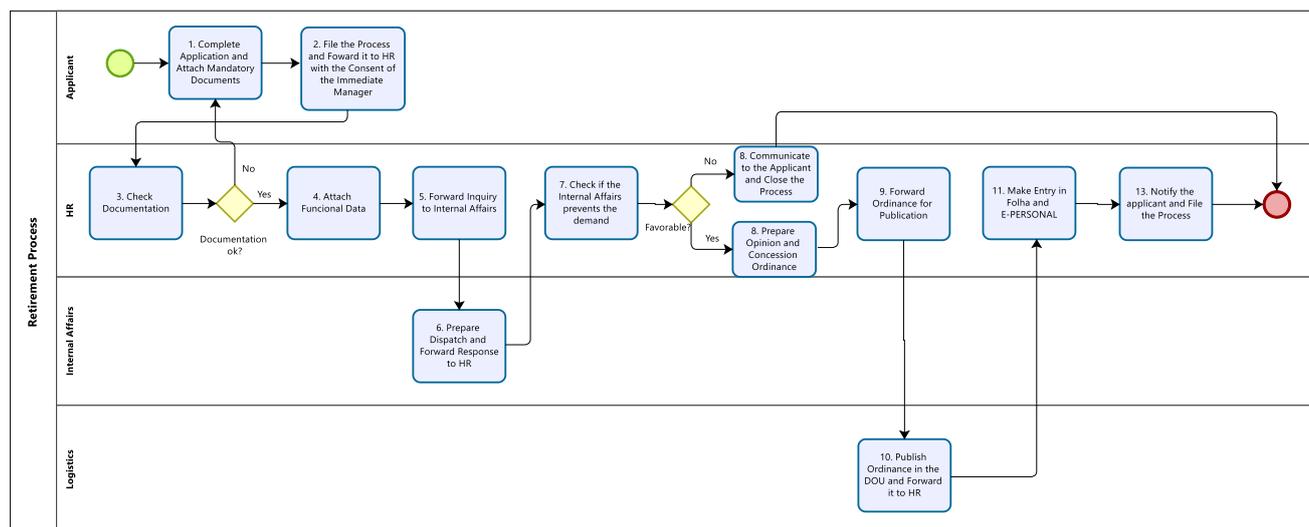


Fig 3. Retirement Process.

As the process mapping had not been carried out in this sector, the focus was not on “drying down” the flow, but on creating a standard to be followed by the agents. The absence of mapping ended up causing each operator to create their own itinerary, leaving each process with different designs, which hindered the newly joined agent when it came to fulfilling the steps of a certain demand.

The diagram with the proposed final design, using the BPMN notation, clearly presented how the flow of the steps of each process would be from the origin, with the possibility of improvements from the observation over time, as new ones appear. bottlenecks. With the use of Process Mapping, it was possible to know the tasks that are part of each stage and how each responsible sector acts in relation to the demands of the other sectors. During the mapping and modeling of the three processes chosen as the basis for carrying out this research, it was noticeable that when the procedure involves several sectors, the possibility of rework is greater, since the exchange between the sectors is not something routine and usually highlights the lack of interaction. to speed up the execution of the task.

In summary, many return steps were identified for rectifications or for complementation of documents or mandatory information and corrections of possible errors that cause delays in the flow of processes. Citing the License for Training Process as an example, practically all the analysis is carried out in the HR sector, making the processing time faster and the flow design being presented without corrections or returns to the applicant. The Postgraduate Leave Process, as it covers other sectors, has a greater possibility of rework and rectifications, due to the absence of a system that allows the exchange of intersectoral information.

V. IMPROVEMENT ASPECTS

As the process mapping had not been carried out in this sector, the focus was not on “drying down” the flow, but on creating a standard to be followed by the agents. The absence of mapping ended up causing each operator to create their own itinerary, leaving each process with different designs, which hindered the newly joined agent when it came to

fulfilling the steps of a certain demand. The diagram with the proposed final design, using the BPMN notation, clearly presented how the flow of the steps of each process would be from the origin, with the possibility of improvements from the observation over time, as new ones appear. bottlenecks. With the use of Process Mapping, it was possible to know the tasks that are part of each stage and how each responsible sector acts in relation to the demands of the other sectors.

During the mapping and modeling of the three processes chosen as the basis for carrying out this research, it was noticeable that when the procedure involves several sectors, the possibility of rework is greater, since the exchange between the sectors is not something routine and usually highlights the lack of interaction. to speed up the execution of the task. In summary, many return steps were identified for rectifications or for complementation of documents or mandatory information and corrections of possible errors that cause delays in the flow of processes. Citing the License for Training Process as an example, practically all the analysis is carried out in the HR sector, making the processing time faster and the flow design being presented without corrections or returns to the applicant. The Postgraduate Leave Process, as it covers other sectors, has a greater possibility of rework and rectifications, due to the absence of a system that allows the exchange of intersectoral information.

VI. CONCLUSION

The objective of this research was to verify how Process Management and Mapping can help the HR sector of a Federal Authority to improve the flow of internal processes, avoiding the incidence of errors and delays, which impair the efficiency of the Public Administration in the meeting the demands of its units. The research started with the application of questionnaires to the employees of the sector, whose answers served as a guide for the design of diagrams referring to the mapping of the processes considered most critical through the use of the BPMN notation and the BizAgi Process Modeler tool, which proved to be of easy to understand and use.

This tool provided the visualization of all stages of a specific process, creating a broad view, facilitating the identification of possible bottlenecks and opportunities for improvement, always taking as a reference the perception of employees and those responsible for each activity.

It is important to point out that, due to the large number of processes, the work was directed to three specific processes, with a focus on building a flow that could be replicated to others, based on the employees' perception of this new dynamic. It is expected that the use of management and process mapping will be multiplied in other sectors of this institution, that it can generate indicators for measuring the results and that these results correspond with the organizational objectives and that there are improvements in the efficiency and effectiveness in the provision of services with the uniformization and standardization of activities. As a suggestion for future work, we suggest a study using a more representative sample of all sectors of this autarchy, verifying the possibility of implementing new diagrams, redesigning current processes, with a view to identifying similarities and differences between the various public bodies.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

REFERENCES

- Alves, R., Lopes, T., Julião, P., & Ferreira, M. (2020). Análise combinatória entre DMAIC e PDCA em um estudo de caso: projeto de implementação de muro de vidro em cooperativa médica do interior paulista.
- BPMN. (2018). Business Process Modeling.
- Caramuta, C. (2021). Integration of BPMN modeling and multi-actor AHP-aided evaluation to improve port rail operations. *Transportation Research Procedia*, 139-146.
- Corradini, F., Ferrari, A., Fornari, F., Gnesi, s., Polini, A., Re, B., & Spagnolo, G. (2018). A guilines framework for understandable BPMN models. *Data & Knowledge Engineering*, 129-154.
- Costa, M., & Moreira, E. (2018). Gestão e Mapeamento de Processos nas Instituições Públicas: um estudo de caso em uma Universidade Federal. *Revista Gestão Universitária na América Latina*, 162-183.
- Damasceno, A., & Pontarolo, M. (2018). Análise Comparativa do Processo de Compras em Prefeituras do Semiárido Potiguar. *XXXVIII ENEGEP*. Alagoas.
- De Oliveira, J. M., & Grohmann, M. Z. (2016). Gestão por processos: configurações em organizações públicas. *Pensamento & Realidade*, 31(1), 56-80.
- Isniah, S., Purba, H., & Debora, F. (2020). Plan do check action (PDCA) method: literature review and research issues. *Jurnal Sistem dan Manajemen Industri*, 72-81.
- Melo, L., & Monteiro, D. (2020, 11 3). Gestão de Processos na Administração Pública: o caso da Diretoria de Cálculos e Perícias do Município de Belo Horizonte. *Revista de Gestão de Projetos*.
- Paim, R. (2007). O que são BPMS: Sistemas de Suporte as Tarefas para Gestão de Processos. *XXVII ENEGEP*. Foz do Iguaçu.
- Paim, R., Cardoso, V., Caullirax, H., & Clemente, R. (2009). *Gestão de processos: pensar, agir e aprender*. Bookman.
- Pereira, F., Jacobsen, A., Martina, J., & Lengler, F. (2017, 1 21). A importância da Inovação na Gestão de Processos Administrativos da Universidade Pública, por meio da Implementação da Tecnologia de Certificação Digital. *Revista da UNIFEPE*.
- Pradella, S., Furtado, J., & Kipper, L. (2016). *Gestão de Processos: Da teoria à Prática*. Atlas.
- Rosa, T. (2020). *Implantação do BPM em uma estrutura multiplanta*. Porto Alegre: URGs.
- Santana, R. R. (2015). *Desafios na Implantação da Gestão por Processos no Instituto Federal Goiano: Um estudo exploratório na administração pública federal*.
- Schmidt, H. (2019). Explosive precursor safety: An application of the Deming Cycle for continuous improvement. *Journal of Chemical Health & Safety*, 31-36.
- Souza, L. S. (2016). *Gerenciamento de Processos: Proposta de melhoria de desempenho organizacional do IFB campus Samambaia*. UNB.
- Villela, C. d. (2000). *Mapeamento de processos como ferramenta de reestruturação e aprendizado organizacional*. Florianópolis: UFSC.
- Zarour, K., Benmerzoug, D., Guermouch, N., & Drira, K. (2019). A systematic literatur review on BPMN extensions. *Business Process Management Journal*.