

Process Flow Mapping Of The Procurement Department In A Construction Materials Distribution Company In Ceará

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Abstract:

Background: The present study adopts a qualitative approach, integrating a research procedure consisting of a literature review and case study methodology. This methodology involved the examination of scientific articles, scholarly works, and internal documents within the studied company. Additionally, interviews were conducted with procurement staff to enrich the research process.

Materials and Methods: The study focused on evaluating the workflow processes within the procurement department of Comercial Maia LTDA., a company operating in the construction materials distribution sector. The research methodology involved mapping and identifying existing processes, proposing improvements, and enhancing departmental effectiveness. This process included updating existing flows, delineating new flows, and formulating Standard Operating Procedures (SOPs) to document activities, responsible parties, and tools utilized at each process stage.

Results: Upon completion of the research, operational process flows were updated, and new flows were established for previously unmapped activities. Additionally, SOPs were developed to provide comprehensive guidelines for operational procedures within the procurement department. These outcomes serve as the groundwork for improvement initiatives within the company's procurement sector.

Conclusion: The study successfully mapped operational process flows within the procurement department of Comercial Maia LTDA. These findings lay the foundation for enhancing departmental effectiveness and efficiency. Moving forward, the formulated SOPs will guide operational activities, facilitating continuous improvement efforts in procurement processes.

Keywords: Procurement; Workflow; Mapping; Processes.

Date of Submission: 25-03-2024

Date of Acceptance: 05-04-2024

I. Introduction

Procurement departments within organizations are undergoing constant modifications, increasingly becoming strategic and essential for achieving company goals and objectives in an ever more hypercompetitive market. Effective planning and control within a procurement sector contribute to internal processes' solidity, visibility, and reliability, playing a crucial role in companies' development.

In the realm of wholesale distribution of construction materials, a primary mission is to supply products with quality, variety, and agility, alongside offering services aimed at providing convenience and profitability to retail customers, who in turn sell these products to end consumers. At every stage of the supply chain in the civil construction materials distribution sector, there are interactions and actions of the procurement department. These range from product registration to formulating a mix of products from specific manufacturers in wholesalers' portfolios, defining stock replenishment parameters based on product turnover, promoting commercial actions to showcase products in retail customers' sales points, to providing support to end customers in situations requiring product warranty claims with the manufacturer.

In this regard, aiming to contribute to the study of this sector, this article will map out the procurement process flow of Comercial Maia LTDA., located in Maracanaú – CE, serving the entire state of Ceará in the civil

construction materials distribution sector, and assess its structure and complexity. The ultimate goal is to identify all processes and possibilities for improvements by the study's conclusion.

This study adopts a qualitative approach grounded in a research procedure characterized as a literature review and case study. Scientific articles, scholarly works, and existing documents within the studied company were examined. Additionally, interviews were conducted with employees involved in procurement activities to enhance research development.

The general objective of this study is to evaluate the flow of processes within the procurement sector of Comercial Maia LTDA., a reference in the civil construction materials distribution sector, in order to map and identify all its processes and propose significant improvements to enhance sector effectiveness.

The specific objectives outlined for this study are as follows: demonstrating the importance of process mapping, defining the best tools for process flow mapping to be used in the case study, and establishing strategies for applying process flow mapping in the procurement sector of the company under study.

This article is divided into five distinct sections, starting with the introduction, followed by the theoretical framework developed to support the positions adopted throughout the research, considering the theme addressed. Next, the methodology is presented, detailing how data collection and research development were carried out. The fourth section provides an analysis of the entire process, and finally, the concluding remarks on the work performed indicate the fulfillment of the proposed objectives.

II. Material And Methods

This study adopts a qualitative approach grounded in a research procedure characterized as a literature review and case study. Scientific articles, scholarly works, and existing documents within the studied company were examined. Additionally, interviews were conducted with employees involved in procurement activities to enhance research development.

The interviews were conducted with the participation of managers from the process sector of Comercial Maia LTDA. Based on this information collection, it was possible to create process flow diagrams and proceed with the development of Standard Operating Procedures (SOPs). The mapping process was executed from August 2023 to February 2024.

Among the authors researched, notable figures include Hunt (2006), Oliveira (2019), and Alonço (2023), all proponents of ideas related to administration, with their publications focusing on process mapping. It can be affirmed that each contributed to enriching this work.

III. Literature Review

For the execution of this research, the aim was to demonstrate how process mapping aids in providing a clearer visualization of the necessary steps for procurement. This enables a straightforward understanding of the operations, their inputs, outputs, and interconnections. Consequently, it becomes possible to analyze whether the activities are being carried out in accordance with the organization's strategic objectives and to identify areas requiring improvement.

Importance of Process Mapping

Process flow mapping is a tool employed by organizations to comprehend, in a logical, clear, and structured manner, how business activities function. This technique allows for the orderly documentation of each stage of the process from start to finish.

According to Hunt (2006¹⁰, cited in Almeida, 2018, p.12),

Process mapping is a tool that identifies and analyzes processes, enabling cost reduction in product development and minimizing failures within the process. Additionally, it is an excellent tool for understanding current processes and identifying those in need of change and their respective improvements¹.








According to Smith (2018), process flow mapping emerges as an indispensable tool, providing an in-depth understanding of organizational operations, revealing activities, interactions, and areas open to enhancement. Process mapping is an important management instrument that presents activities in an ordered manner, objectively facilitating the understanding of each stage and the resources required for a productive process or service².

Tools for Process Flow Mapping

There are several different ways to conduct process mapping. Among them, we can highlight flowcharts, diagrams, process maps, and mapoflowcharts. One of the most important stages in mapping is graphical representation. In this article, we will use the flowchart. According to Alonço (2023), a process flowchart is a graphical representation that describes the sequential steps and stages of a given process. Furthermore, this tool can be used to address processes in any organization. Additionally, as per Alonço (2023), through geometric

figures and other similar elements (see Table 1), a well-designed flowchart can simplify the flow of information, activities, and other elements that constitute each type of process in an organization³.

Table 1 - Main Symbols of a Flowchart

	Indicates the initiation or termination of the process
	Specifies each activity that must be executed
	Denotes a decision point
	Indicates the direction of flow
	Specifies the documents used in the process
	Indicates a wait state
	Signifies that the flowchart continues from this point in another circle, with the same letter or number appearing within.

Source: Bastiani (2012)⁴

In this manner, designing flowcharts for the procurement processes of the company under study will be of paramount importance to investigate the process adopted for control and management, diagnose problems, and propose improvements. As explained by Souza (2020, p.15), "Flowcharts are powerful visual tools that aid in the analysis and continuous improvement of procedures, promoting efficiency and transparency in operations⁵."

Application of Process Flow Mapping

Process flow mapping is essential for visualizing all operational stages of the process, as well as providing a detailed description and identification of the resources needed for procurement and the interrelation of other sectors of the company or stakeholders. The design of process flows also aids in identifying bottlenecks and unnecessary steps that increase the time required to complete a particular activity. This enables the precise elimination of bottlenecks and optimization of processes, resulting in a leaner process design.

"Process mapping has been adopted in companies as an effective technique to enable organizations to graphically view their business system at any level of detail and complexity" (Madison, 2005¹¹, cited in Oliveira; Nascimento, 2019, p. 03)⁶. Through correct implementation, interpretation, and monitoring of process mapping, it is possible to track the real situation of resource utilization within an organization, enabling measurement and minimization of production losses (Roque, 2010, cited in Oliveira; Nascimento, 2019, p. 04)⁶.

One of the challenges encountered is knowing where to start and, more importantly, engaging the individuals who will gather the information. A deep understanding of the activity and a high level of detail are required, along with constant revisions to ensure that the described steps align entirely with the current process scenario.

For flowchart design, programs such as Microsoft Excel, Microsoft Visio, or Bizage modeler are commonly used. These programs come pre-configured with the symbols that compose the flowchart, as well as directional arrows indicating predecessor and successor steps, thus creating the beginning, middle, and end of the process graphically.

Campos and Lima (2012⁷, cited in Oliveira; Nascimento, 2019) present ten steps for process mapping: 1. Identify process objectives; 2. Identify process outputs; 3. Identify process inputs; 4. Identify process components; 5. Identify process suppliers; 6. Determine process boundaries; 7. Document the current process; 8. Identify necessary process improvements; 9. Consensus on improvements to be applied to the process; 10. Document the revised process.⁶

Thus, the application of process flow mapping contributes to organizations having a documented representation of their stages, enabling the implementation of improvements. The company researched in this article is one of the oldest in the construction materials distribution sector in the state of Ceará, with nearly 40 years of existence. Considered a reference in this segment, it stands out for excellent management, modern systems, excellent physical structure of its headquarters, commercial team, and logistics.

However, only part of the knowledge related to the purchasing area is outlined in the form of a flowchart, namely the processes of product registration and purchase order issuance. The procurement department of Comercial Maia LTDA. is also responsible for other activities such as order follow-up, scheduling of trucks for

goods receipt, invoice entry, handling of damages, and control of supplier funds for commercial actions, among others. Therefore, the review of existing flows for product registration, purchase order issuance, and the design of other departmental flows became the main focus of this article's study. Thus, the mapping of these flows allows knowledge that was previously conveyed only verbally by experienced employees to be documented and structured.

IV. Results Analysis

The procurement department of a construction materials distribution company stands out as one of the key areas of the business, integrating with two other fundamental areas: Sales and Logistics. The remaining areas of the company play supportive roles, contributing to ensuring the efficient operation of the company's essential areas (Vieira; Almeida, 2022)⁸. In light of this, the process mapping planning of the company was carried out, starting from the processes of the procurement area. Based on this definition and using a macroflow of the area, the role of procurement in the business context was identified. Activities related to the execution of tasks and the results of the area were initiated (Crivellaro; Vitoriano, 2022)⁹.

The activities were segmented according to the process macroflow, and the initial phase involved conducting interviews for mapping. Sketches and drafts of the process were made using the Visio tool based on these interactions. After preparation, the documents were submitted for approval by the area manager, accompanied by a description called SOP (Standard Operating Procedure), in the 5W2H format, with the tool used for preparation being an Excel spreadsheet. Process mapping began in August 2023, with the estimated completion target set for September of the same year. However, upon commencing field activities, developments and complexities in the area were noticed. In addition to the criticality of the process, there was a total restructuring of the team, with changes in personnel, training, and respect for the learning time of the new team, with most employees having been with the company for up to a year (Crivellaro; Vitoriano, 2022)⁹.

Thus, the activity was extended, and almost all 10 processes in the area were finalized by January 2024. Throughout the mapping process, opportunities for improvement in task execution were identified, ranging from the automation of some steps to technical training and restructuring of the staff. The developed flows are available in the following Table 2:

Table 2 - New or Revised Flows

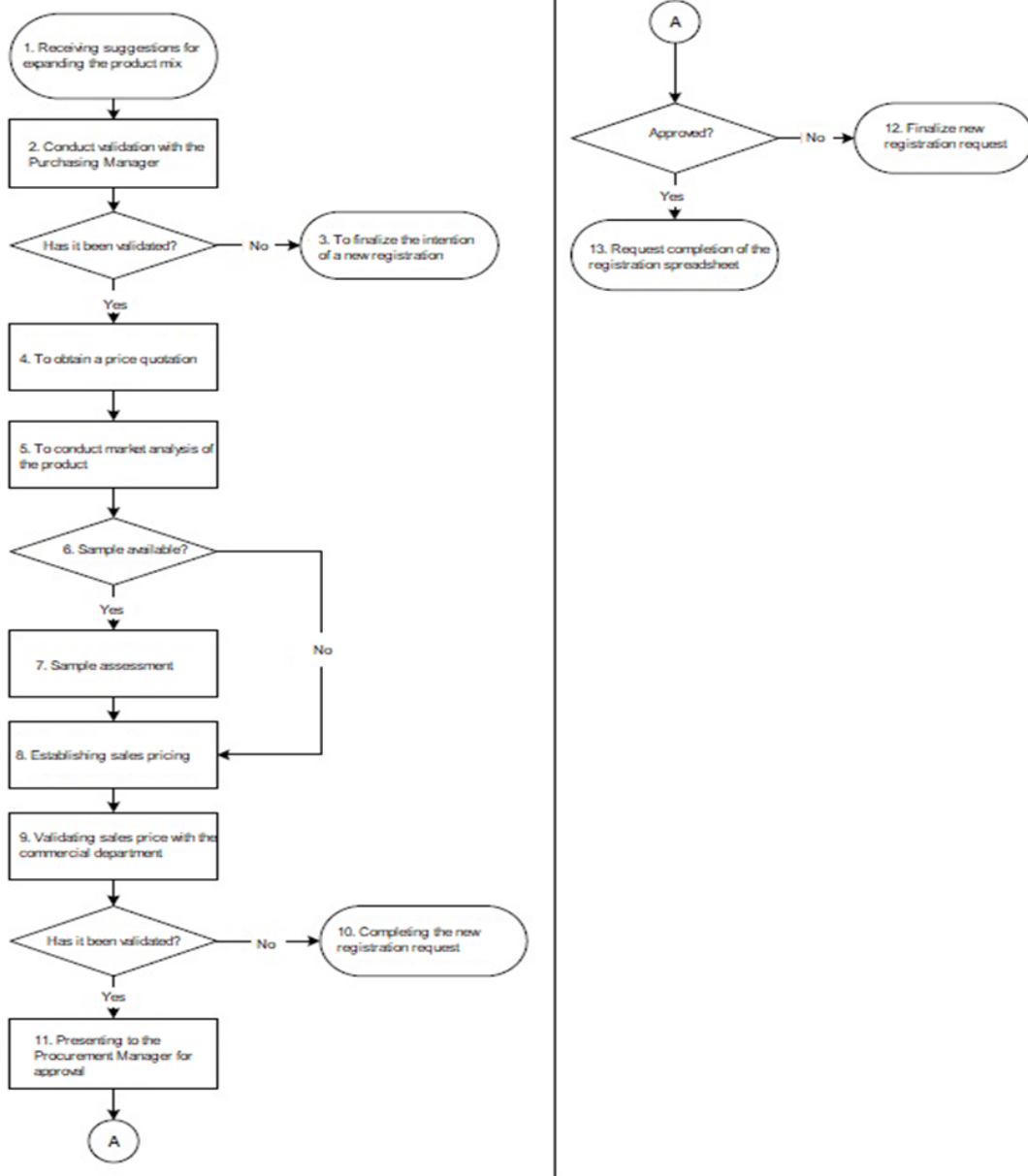
Code	Revision Date	Activity Flow	Type
FL-CMP-001 V-01	December 26, 2024	Analysis of Criteria for Opening New Registrations	New
FL-CMP-002 V-01	December 26, 2024	Product Registration	Revised
FL-CMP-003 V-01	December 26, 2024	Analysis and evaluation of purchasing needs	New
FL-CMP-004 V-01	December 26, 2024	Purchase Order Issuance	Revised
FL-CMP-005 V-01	December 26, 2024	Purchase Order Follow-up	New
FL-CMP-006 V-01	December 26, 2024	Creation and control of funds	New
FL-CMP-007 V-01	December 26, 2024	Receiving scheduling	New
FL-CMP-008 V-01	December 26, 2024	Pre-Entry and Entry of Invoices	New
FL-CMP-009 V-01	December 26, 2024	Supplier visit scheduling	New
FL-CMP-010 V-01	December 26, 2024	Resolution of damages	New

Source: Researcher Data

During the mapping process, it became evident that there was a need for development in the Pricing area. Initially identified as an activity to be implemented without a specified deadline, after mapping, it was defined as a project priority for the year 2024. For the year 2024, training sessions for employees related to these activities will be scheduled, with both physical and virtual environments being utilized. The "book" containing flow diagrams of procurement processes will be made available through printing and PDF files in network folders accessible to all company managers in the Google Drive model.

Verification of training for all area employees will be conducted through a specific form known as a training record. To ensure compliance with documented activities, periodic audits will be conducted and continuous improvement practices will be implemented. These measures aim to ensure the optimization and full compliance of processes, contributing to decision-making and success in activities. In total, ten flowcharts and their respective SOPs for the procurement area were generated, covering the following macro-processes: (1) Analysis of Criteria for Opening New Registrations; (2) Product Registration; (3) Analysis and Evaluation of Purchase Needs; (4) Purchase Order Issuance; (5) Purchase Order Follow-up; (6) Creation and Control of Funds; (7) Receiving Schedule; (8) Pre-receipt and Invoice Entry; (9) Supplier Visit Scheduling; and (10) Resolution of Damages. Of these ten flowcharts, we will highlight four that we consider most important, as depicted in Figures 1, 2, 3, and 4 below:

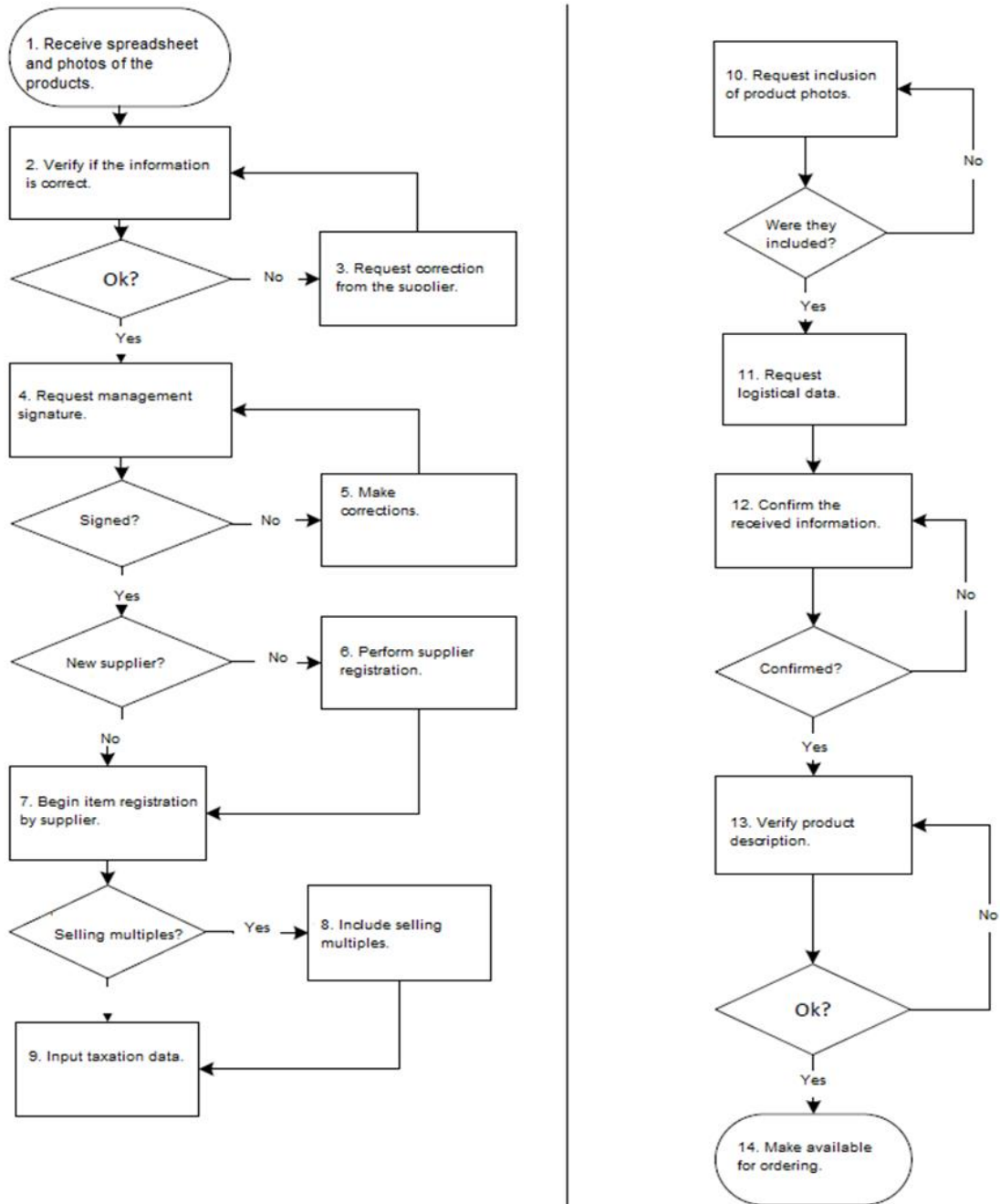
Figure 1 - Activity Flow - Analysis of Criteria for Opening New Registrations



AREA MANAGER: LUIZ MAIA

Source: Researcher Data

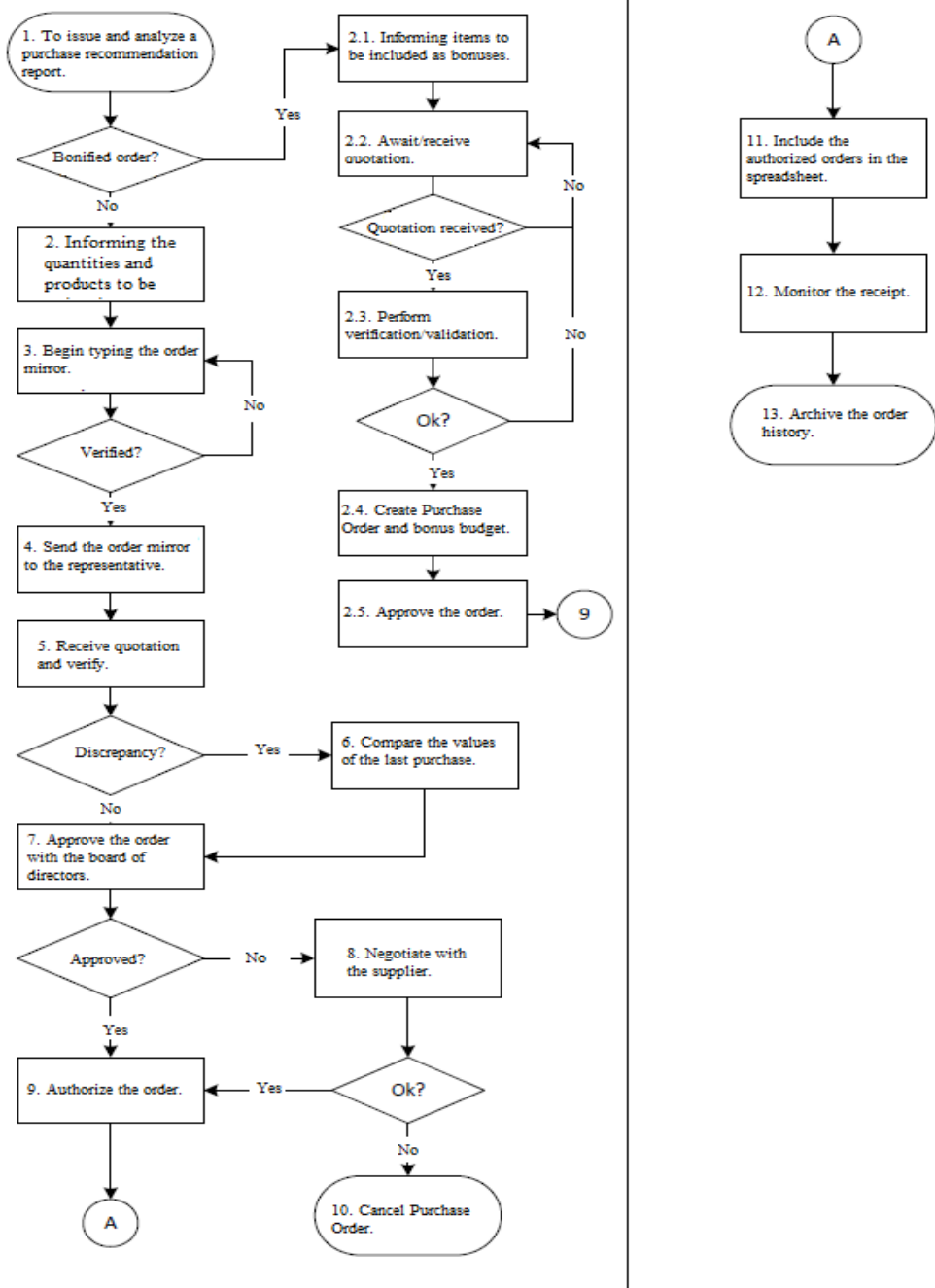
Figure 2 – Activity Flow – Product Registration



AREA MANAGER: LUIZ MAIA

Source: Researcher Data

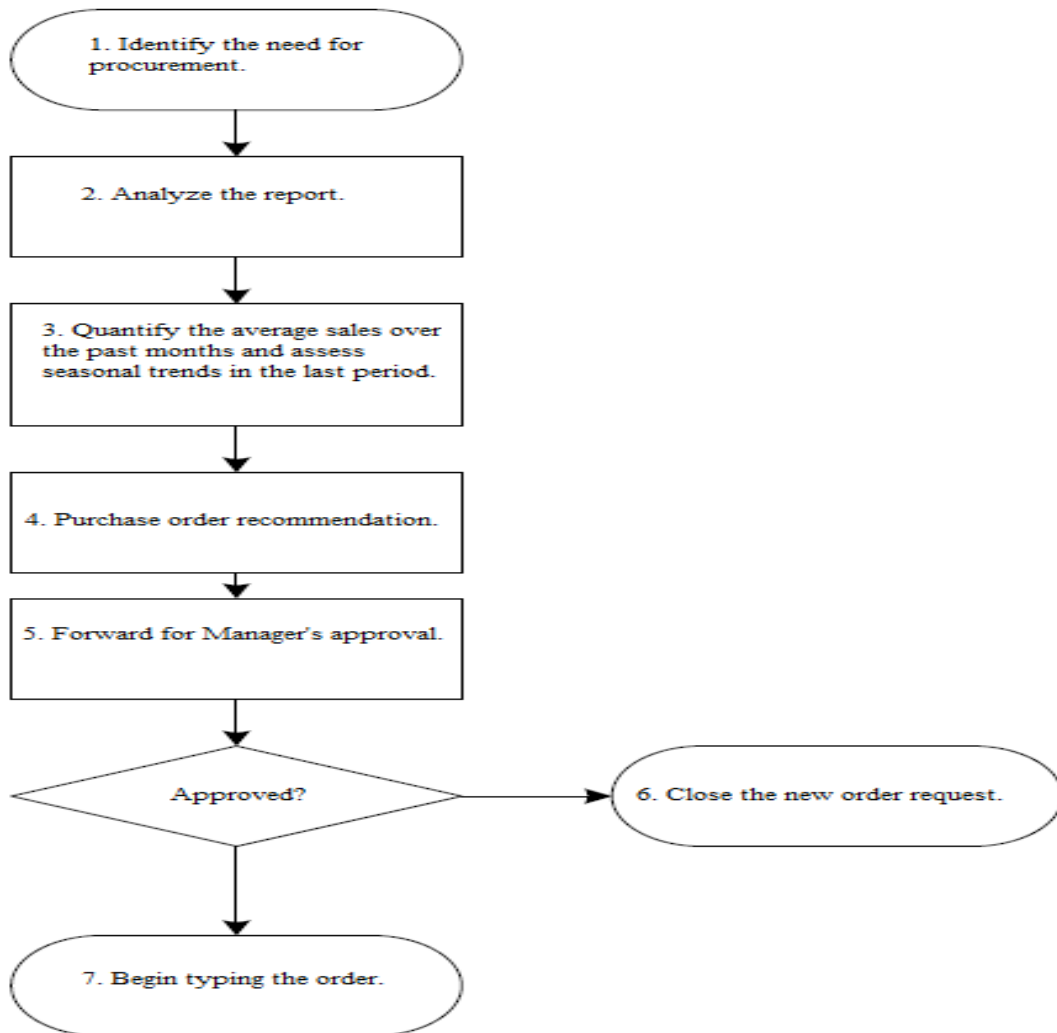
Figure 3 – Activity Flow – Analysis and evaluation of the need for purchases



AREA MANAGER: LUIZ MAIA

Source: Researcher Data

Figure 4 – Activity Flow: Purchase Order Issuance



AREA MANAGER: LUIZ MAIA

Source: Researcher Data

All flowcharts and SOPs were reviewed and approved by the IT department managers, who are responsible for the process department, procurement managers, and the board of directors of Comercial Maia LTDA.

V. Conclusion

The primary objective of this scientific article was to review the process flow mapping in the procurement department of Comercial Maia LTDA. Throughout the research, the aim was to understand the operational dynamics, identify potential bottlenecks, and subsequently propose improvements to optimize the activities performed by the procurement team.

The research fully met the proposed objectives. The interviews, conducted by the process department managers (one of whom is this researcher), with the employees were particularly crucial, providing valuable insights into the internal perception of the adopted procedures, thus offering a comprehensive and in-depth view of the existing practices.

The study identified opportunities to enhance internal communication, such as the example of correcting tax registration information upon invoice pre-entry. This aims to streamline processes and increase operational efficiency.

Another significant contribution was the creation of a process book that will serve for training and integration of future employees, as well as internal audits of procurement processes. The implementation of the

suggested recommendations will require a collaborative approach and an organizational culture focused on continuous improvement.

Finally, it is recommended that after an in-depth study of these process flows, the necessary improvements for procurement development be implemented. This study represents an initial step in enhancing existing practices, being decisive for the continuous pursuit of operational excellence in the procurement area of Comercial Maia LTDA.

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