OPERATIONS AND SUPPLY CHAIN MANAGEMENT
Vol. 15, No. 2, 2022, pp. 164 - 173
ISSN 1979-3561 | EISSN 2759-9363

A Comprehensive Business Process Management Application to Evaluate and Improve the Importations Practices on Big-box Stores

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ABSTRACT

Big-box or chain stores are massive retailers that sell all types of products to final consumers. Managing business processes that integrate information systems is a critical issue in big-box stores nowadays. Commercial initiatives have focused on optimizing internal processes to enhance productivity and react to fluctuating business environmental forces. This research proposes a comprehensive business process management (BPM) design and application for the importations process on a big-box store located in Colombia, highly integrated with basic and advanced information systems. Big-box stores use advanced information systems that synchronize with multiple essential internal processes. We modeled the importations process phases with a robust graphical framework for BPM methods and flexible automation. We evaluate the actual process time performance and contrast its current state with the novel BPM model implementation benefits. The application of the proposed BPM model contemplates a 43% reduction in the execution times of process activities with a projected 30% decrease in default costs.

Keywords: *Business Process Management (BPM), Big-box stores, Importations process.*

1. INTRODUCTION

Business process management (BPM) focuses on the knowledge, mastery, and continuous improvement of the processes and resources to control operational risks and meet organizational objectives (Sinur and Bell, 2003; Holzmüller-Laue *et al.*, 2013). Chang (2016) describes BPM as a business methodology that develops the efficiency of business processes through modeling, automation, monitoring, and optimization. Organizations constantly need to enhance their operations but lack the flexibility to adapt to the unpredicted conditions presented by fluctuating business environments. BPM uses designing tools, techniques, and management methods to identify, analyze, execute, and cultivate processes. BPM has become a critical method to provide companies with adjustable practices that enable process leaders to review and modify activities to increase adaptation—ensuring that those involved can respond efficiently to unexpected changes. (Castillon-Mendoza and Solorzano-Aranzamendi, 2012).

Companies' studies about BPM implementations reported that the benefits include considerable cost savings

and reduced service times. BPM is considered a platform to build new applications or improve existing ones, investigating various ways of managing operations and resources to accomplish the established objectives (Zhang *et al.*, 2004). Smith and Fingar (2003) state the importance of the information technology infrastructure in BPM since it allows companies and their departments to model, implement, and manage their business processes. BPM controls the processes and resources using technology to connect all business levels, including directors or managers, with all activities. Following the premise that directing the processes and resources toward the organizational goal requires knowing the system's restrictions to achieve success (Dani *et al.*, 2019).

Nowadays, big-box stores use advanced technology integrated with information systems to operate most logistics processes. Big-box or chain stores are massive retailers that sell all types of products to final consumers. Numerous big-box stores are national, or at least with massive regional operations. They are often headquartered in a distant location, and many activities, including legal, financial, accounting, and marketing decisions, are practically run from the corporate headquarters with solely their information systems (Goetz and Rupasingha, 2006). The adequate integration of the information systems in conjunction with their business operations is crucial to enhancing productivity. BPM applications seek to facilitate this by providing higher control and monitoring of the value activities.

As denoted, the objective of BPM is to optimize the efficiency of processes through automation, providing support in the business environment to increase flexibility and productivity. Although recent studies show that BPM solutions have outstanding benefits (Dani *et al.*, 2019; Matejaš and Fertalj, 2019), to our knowledge, there are no recent studies comprehending applications in big-box stores. Therefore, our study aims to develop and detail a BPM implementation identifying the critical activities in an actual big-box store business process. We seek to evaluate the benefits of a BPM application on a Colombian big-box store positioned nationally with 270 chain stores. The company is a highly low-cost retailer which tries to offer customers products at the lowest possible rates. Products sold at the chain stores are acquired from local and international suppliers or producers; the store works by catering to extensive customer demography and best use scale economies.

The retail store administrators claim that the excellent inventory management and cost-cutting at every stage of the business allow them to provide minimal customer services. However, in recent years, one of their most critical process, importations, has presented difficulties with the traceability of the information and the response proficiency of their internal clients. The administrators state that an ineffective follow-up in the international purchases and product nationalization is causing a lack of orientation and planning since it is impossible to identify the process bottlenecks on time. Employing BPM, our research proposes the design and automation of the importations process phases for the described big-box store, aligning the operational activities with the objectives and strategies to concentrate the efforts on value creation. We complement the BPM application by modeling all activities with their projected time and expected improvements. The development allows permanent visibility and measurement of each modeled phase, significantly improving the response time, productivity, and performance, including increased customer satisfaction and staff efficiency.

2. THEORETICAL FRAMEWORK

In its initial applications, BPM was considered a technical or managerial discipline; currently, researchers agree on its multidisciplinary nature conveying the novelty knowledge concerning its development (Grau and Moormann, 2014). The use of information technology software with a built-in alert system, such as BPM systems, can be a practical support for monitoring processes, reducing the complexity and uncertainties, and enhancing supervision of risks within organizations (Suša Vugec *et al.*, 2018). BPM conceptualization is assessed in the literature with a chronological evolution, known as waves, including numerous research that unified valuations into the methodology. The following sections exemplify this chronological assessment and its current state.

2.1 BPM Origins

The first definitions of work improvement methodologies emerged in the 1920s; these focused on the production and analysis to design and implement effective methods in the operation of activities. In the 1950s, researchers included a new system valuation based on the fulfillment of objectives and goals covering the levels of the organization. Up to this point, the administration and improvement of objectives were widely studied and applied. Still, it was not until the 1980s that scholars introduced quality aspects in the analysis. These emphasized the concepts of total quality administration (TQM), enterprises resource planning systems (ERP), and the idea of the value chain. The organization is visualized as a decomposition of its parts, identifying the sources of competitive advantage in activities generating value. This first stage is recognized in the literature as the "first wave" (Kaptelinin *et al*., 2003; Smith and Fingar, 2003a, 2003b).

During the 1990s, the definitions followed the concept of re-engineering, which explained the parameters of review and re-design of processes to improve measurement systems by signifying it in a process-oriented form. The appropriate application of continuous improvement and innovation gave way to competitiveness. Re-engineering introduces concepts such as streamlining, restructuring, transformation, and reinvention of processes with downsizing. This stage in the evolution is considered the "second wave" (Kaptelinin *et al*., 2003; Smith and Fingar, 2003a, 2003b). BPM arose as the third wave in the 2000s. BPM encompasses the technologies and practices of all waves and on all sides of ERP technologies and techniques, including re-engineering to establish an organization more adjusted to current business processes and management (Smith and Fingar, 2003; Smith and Fingar, 2003; Kaptelinin *et al.*, 2003; Castillon-Mendoza and Solorzano-Aranzamendi, 2012). **Figure 1** shows a simplified timeline of the evolution, and Table 1 shows the three waves in the development of BPM and its importance.

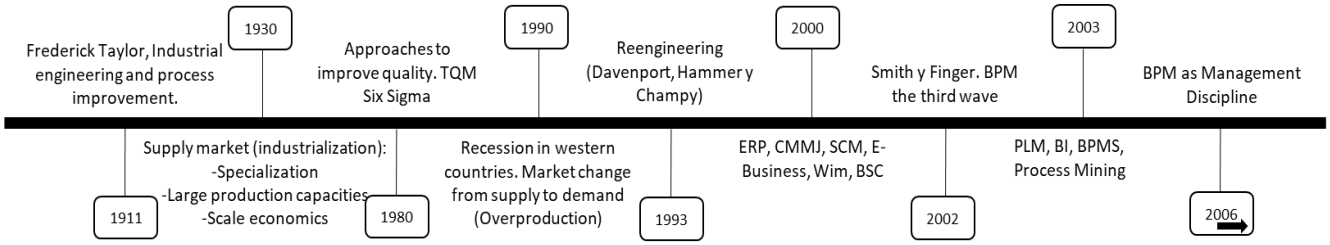

Figure 1 BPM Evolutionary Chronological Evolution

Table 1 Waves of The Evolution of The Business Management

EVOLUTION	IMPORTANCE
Movement: First Wave	
ERP systems emerged	Productive processes
Movement: Second Wave	
Re-engineering and post-engineering	Strategic processes
Movement: Third Wave	
BPM	Strategic and support processes

2.2 BPM Life Cycle

BPM covers cultural, organizational, and legislative aspects, including the technological level and expanding the design, execution, and measurement processes. There are several views on the BPM life cycle which consists of four cyclical points: process design, system configuration, process enactment, and general diagnosis (Van der Aalst *et al.*, 2003; Van der Aalst, 2004a, 2004b; Havey, 2005; Hill *et al.*, 2006). In this context, process design refers to paper-based business processes modeled electronically, whose graphical standards are essential in the life cycle. System configuration synchronizes the previous step with the system infrastructure, such as directing roles and organization charts on the company directory. Process enactment consists of implementing the graphical business process modeling. A BPM analyst identifies and improves all the processes in the general diagnosis stage by implementing a cyclical approach.

BPM modeling techniques have expanded in recent decades. Some researchers emphasized the significant advantages that BPM modeling incorporated into systems management. Cernauskas and Tarantino (2009) studied operational risk management with process control and BPM modeling, proposing a model for financial institutions based on a methodology that integrates process designing and statistical power. These terms are used in electronic workflows as a tool to improve processes. Often BPM seeks to reduce costs and cycle times, reduce operational risk, and enhance monitoring of activities. Swan (2007) studied the effects of process management and inquired about the conceptualization BPM offers to managers regarding design, configuration, enactment, supervision, and business process diagnosis. Sun (2007) presented studies about the analysis and design of workflow in BPM, stating that the successful management of BPM depends on the excellent graphic process modeling of the workflow that fosters the control and coordination of activities. The graphical process models (GPM), such as meta graphs, are derived from graph theory, which portrays the information of BPM to provide valuable data for the decision-making process and communication between managers.

2.3 BPM Current Research

In the literature, BPM methodologies are classified into those focused on implementing large-scale enhancements in an organization, those based on the gradual improvement of individual activities and business processes, and those based on the field of information technologies focused on process automation (Harmon and Wolf, 2014; Matejaš and Fertalj, 2019). Research by Harmon and Wolf (2014) showed that organizations currently use the latter more frequently with acceptance as a practice for continuous improvement of business processes. For instance, Danilova (2019) investigated the role and responsibilities of process administrators in BPM and the obstacles and enablers of its application. The study proposes a theoretical framework on the property and control of the process. Suša Vugec *et al.* (2018) considered BPM in practice. Due to the technological development of the last decades, their investigation showed that the traditional BPM approach was not sufficient for achieving superior organizational performance. The main limitation of traditional applications is developing community or social software in new areas. In the research, the authors identified case studies that have attempted to analyze social BPM based on dimensions of the structure, process and content, risk, and crisis management.

Lahajnar and Rožanec (2016) presented different methodologies to evaluate BPM effectively. The research emphasizes that BPM applications in organizations require an adequate methodological approach. Although businesses, especially software companies, have promoted many solutions focused on using technologies when the methodology remains essential. The study simplifies the adoption of these decisions by building a framework for evaluating BPM practices by designing a hierarchical decision-making model, which formalizes the decision-making process, contributing to an appropriate final decision for the organization in terms of the methodological approach. Likewise, Aversano *et al.* (2016) discuss that adequate BPM implementations feature the mismatches between business processes and supporting software systems and performance.

Fera *et al.* (2017) emphasized the application of a business process methodology for implementing an RFID system in a warehouse. This study focused on a BPM methodology evaluating RFID technology for a bicycle manufacturer. Results indicate that the application of BPM showed improvements in economic profitability and processes traceability in the warehouse. ZhenHua *et al.* (2009) point out BPM prototypes or architectures developments as a solution for third-party logistics companies to integrate the organization processes with their clients and partners. Silva *et al.* (2019) delved into the study

of BPM by describing a company's mapping and analysis processes in the Brazilian shipbuilding and offshore construction sectors. The authors developed a case study, doing semi-structured interviews to collect the data. The study used the ANSI standard flowchart tool to visualize the process activities.

Similarly, Do Nascimento *et al.* (2019) analyzed the applications of corporate governance and the unified BPM cycle in public credit recovery activities. The authors considered implementations of the corporate governance structure and audition of the existing processes. The study was conducted in a federal public defense agency using questionnaires, observation, and focus groups. Hrabal *et al.* (2020) studied BPM beyond implementation methodologies, workflow, and automation by analyzing the critical human factor roles employing modeled competencies for process owners, process analysts, and industrial engineers. The focus is on qualitative research, using questionnaires, interviews, and case studies in Czech companies. The research found that competencies are similar in small and large organizations and recommended different role positions for both. These competency models are a tool for human resource management, which can improve the success of BPM projects.

Keates (2019) investigates BPM in implementing IoT devices in livestock operations in Australia, such as extensive farms, and the importance of panels on websites and mobile applications towards an integrated control center, with BPM at its core, promoting support for decision-making. The investigation focuses on Meat and Livestock Australia (MLA), Hitachi Consulting, and individual agricultural companies. The study uses BPM systems to drive workflow and process orchestration to enhance data collection and decision-making. Likewise, Suša Vugec *et al.* (2019) investigated how adequate BPM and sound corporate performance management (CPM) is essential in business practice to improve overall organizational performance (OP). The article explores the link between BPM and CPM and its alignment on OP. The study surveys medium and large organizations in Slovenia and Croatia and concludes that the BPM-CPM alignment increases when the BPM and CPM maturities are higher, consequent with greater OP.

Tsagkani and Tsalgatidou (2022) highlight that BPM models constitute a great source of knowledge, but participants sometimes cannot understand them. Modeling abstraction techniques assists in better understanding process models. The study reorganizes the existing process models by focusing on the abstraction of activities, data, and roles, among others, to exploit the structure of the model as the properties of the components. The research presents the design of a tool for the automatic application of the suggested abstraction rules to differentiate models of actual processes, allowing a better understanding for participants.

Research on BPM remains widely active, including topics such as process-oriented vision analysis methods for business information systems and identifying success factors in BPM-based theoretical models (Trkman, 2010; Zota and Ciovica, 2015; Matejaš and Fertalj, 2019). Matejaš and Fertalj (2019) emphasize the diverse and valuable endeavors to integrate BPM into existing systems; however, studies might lack the conceptual models, components, technologies, tools, and other guidelines for their implementation. While this brief review of the theoretical framework denotes the increasing use of BPM and its different approaches in several organizations, an essential need for further research on detailed models describing the integration of BPM and components with current practices is fundamental. We found that few studies have used implementation tools and methodologies to re-design or improve essential business processes in chain stores or similar businesses. We believe that our proposed research methodology expands the body of knowledge about BPM in business environments and aims to display a comprehensive BPM application with all its essential components to evaluate and improve process practices in big-box stores.

3. BUSINESS PROCESS MANAGEMENT DEVELOPMENT IN A BIG-BOX STORE

Organizations face significant challenges and limitations due to globalization, market competition, and supply chain uncertainty, among others, which require coordination and cooperation between all parties and information technology needs (Wang *et al.*, 2020). After many decades of technological progress and advances in cooperation, we are more connected than ever, and it is crucial to develop innovative operations strategies (Huang *et al.,* 2020; Sansone *et al.,* 2020),

Big-box stores use advanced technology integrated with information systems to operate most logistics processes. Big-box or chain stores are massive retailers that sell all merchandise to final consumers. Retail is generally defined "as the activities that include selling goods or services directly to the end consumer or the final customer for their personal use through shops, personal selling, door-to-door selling, markets, over the internet" (Daultani *et al.*, 2020, p.1). Retail has undergone significant transformations over the years, mainly due to the digitization of businesses, the change in processes, and consumer behavior (Simangunsong and Subagyo, 2021).

This research analyzes the activities in one of the largest big-box stores in Colombia. The company has approximately 70 years in the retail market, with 100% national capital and an approximate market share of 22 percent. It has more than 400 stores across the national territory, including 270 chain stores and an assortment of smaller stores focusing on selling locally. This big-box store is recognized as the leading retailer in commercializing optimal quality consumer products. The company markets a broad portfolio of private and store-brand products in several categories: grocery, textiles, toys, sports, home appliances, technology, and others. We focus our analysis on an essential process, importations that involve international purchasing and product nationalization. The company imports products from different countries, including the United States, China, Panama, Canada, Netherlands, Ecuador, Mexico, Peru, Turkey, Argentina, and Chile. Managers and administrators report issues with the traceability of information and respond to internal customers because most tasks are performed manually using spreadsheets integrated with an ERP-SAP system. The process considers only the orders from SAP into purchases, cost settlements, and receipt of merchandise. The importations process is considered critical for the big-box

store's performance. The company shares dynamic spreadsheets using an ERP-SAP system to develop the purchase orders, costing settlements, and delivery of goods.

Currently, the lead times of most of the activities in importations are not evident and need to be approximately estimated, which difficulties identifying the drawbacks of the supply chain. The proposed BPM application preliminarily analyzed the importations operations' actual status and evaluated the process after re-designing. As part of the framework approach to assessing if the modification of the procedure could benefit the activities of the as-is practices, we estimated the expected time improvement required to execute each activity. After the re-design, we considered the initial estimated time minus a projected time saving, applying a conservative reduction coefficient between the range of 20% and 40%. We developed this analysis with the assistance of the general administration responsible for the importations' performance. After considering these adaptations, it was possible to estimate new overall lead times for the importations operations.

The first task of the importations process begins with the suppliers, as presented in **Figure 2**, with the development of a purchase review, where some aspects are quoted and negotiated (e.g., price, freight, and terms of negotiation). After this evaluation, the supplier places and accepts the purchase order, where forms and permits are shared. The next stage is coordinating the shipment with the cargo agent, the transportation intermediary. The supplier sends the invoice supporting documentation, a requirement for merchandise nationalization. This material is essential to initiate the payment order, which the big-box store financial department performs.

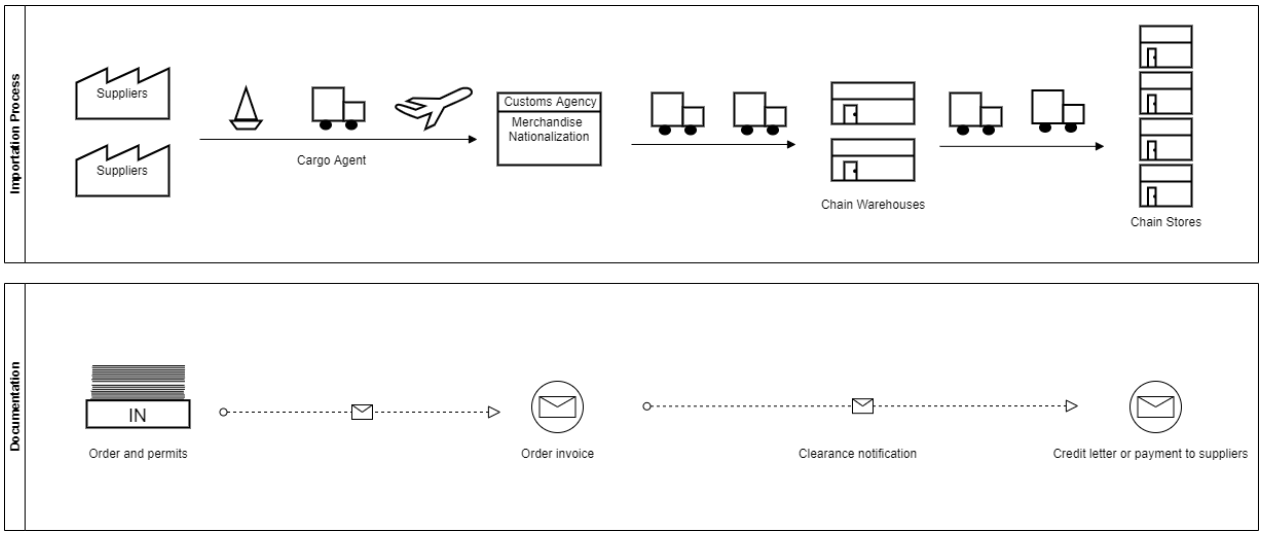

Figure 2 Big-Box Store Actual Importations Process and Documentation Requirements

The clearance notification documentation refers to the customs agency's merchandise nationalization once the shipment arrives. A pre-inspection is developed on-site, and if approved, the unloading is made according to the cargo and its documents. Once the product is nationalized, the big-box store transportation logistics complete the shipment from the port containers to the warehouse. This activity is performed swiftly; otherwise, the company might incur late fees in port. Finally, payments are made to suppliers. The overall process includes the suppliers, cargo agents, and customs agencies. Consequently, it is possible to distinguish three main phases (represented in **Figure 3**) in the importations process: (i) the suppliers' evaluation, (ii) the financial management, and (iii) the delivery of goods.

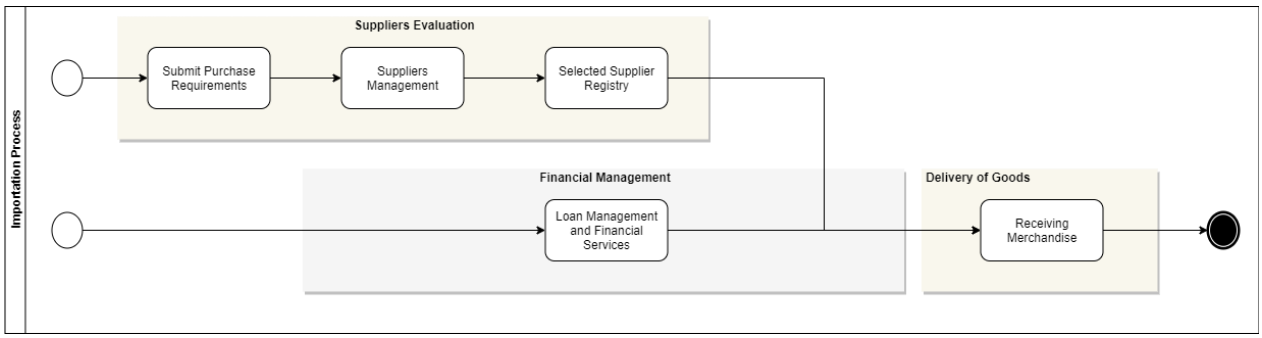

Figure 3 Importations Process Phases

Given this structure, the possible improvements of the process rely on tracing and automating the receiving activities, systems controls, management activities, and delivery. Administrators, via an internal survey, claim that the framework of the current events is inadequate to ensure the required visibility of the entire process. The lack of efficient coordination with an information system that controls all functions is causing delays and ineffective

processing times (Chams-Anturi *et al.*, 2020). Therefore, this research exclusively considers the suppliers' evaluation selection all through receiving the goods or merchandise, as they are more sensitive in fulfilling the importations process.

We modeled and re-designed the previously defined main phases using BPM. Initially, **Figure 4** describes the detailed activities needed to execute the suppliers' management after submitting the purchase requirements in the suppliers' evaluation phase. In the beginning, the purchasing department of the retail store submits a purchase requirement shared with available suppliers. The purchasing department records all available offers and selects the most suitable. The commercial area of the retail store must approve the order since the supplier must be in good standing (i.e., previous orders properly fulfilled on time). If the order is approved, the purchasing department confirms the supplier order. If the order is not approved, the purchasing department is notified, and another competing order is considered for evaluation.

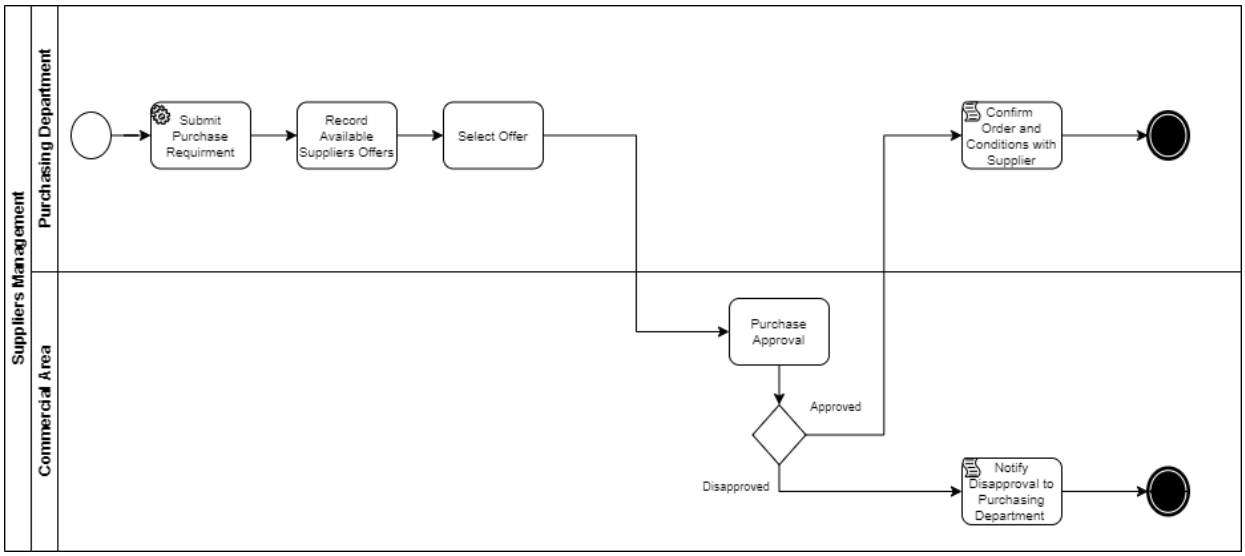

Figure 4 Suppliers Management

Once the order is confirmed, the supplier registry must be created with the commercial area, as presented in **Figure 5**. The supplier sends the order requirements and payment conditions. The commercial area registers the supplier, creates a purchase order, and notifies if the payment type is made with a line of credit (credit note or letter) or direct payment previous contact with the big-box store's loan management and financial services. These activities conclude the suppliers' evaluation phase.

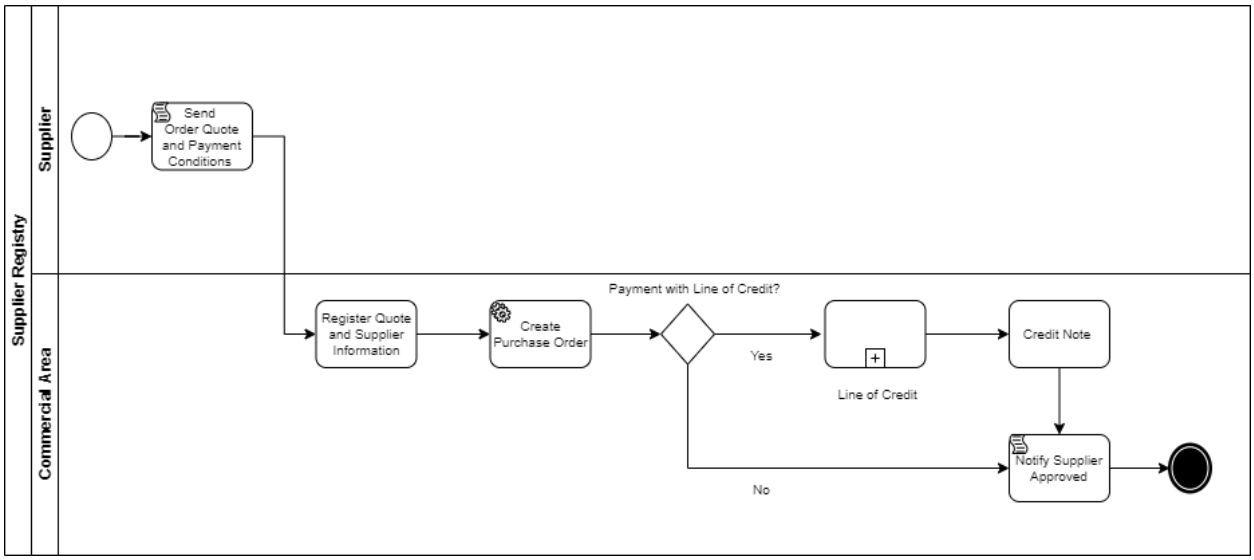

Figure 5 Suppliers Registry

If payment is via credit note, the loan management and financial services is the primary task for the financial management phase, as denoted in **Figure 6**. The treasury department of the retail store requests a loan amount to various banks. Once a line of credit with the conditions and bank is selected, the administration authorizes and notifies the treasury department to use the line of credit in the required orders or activities.

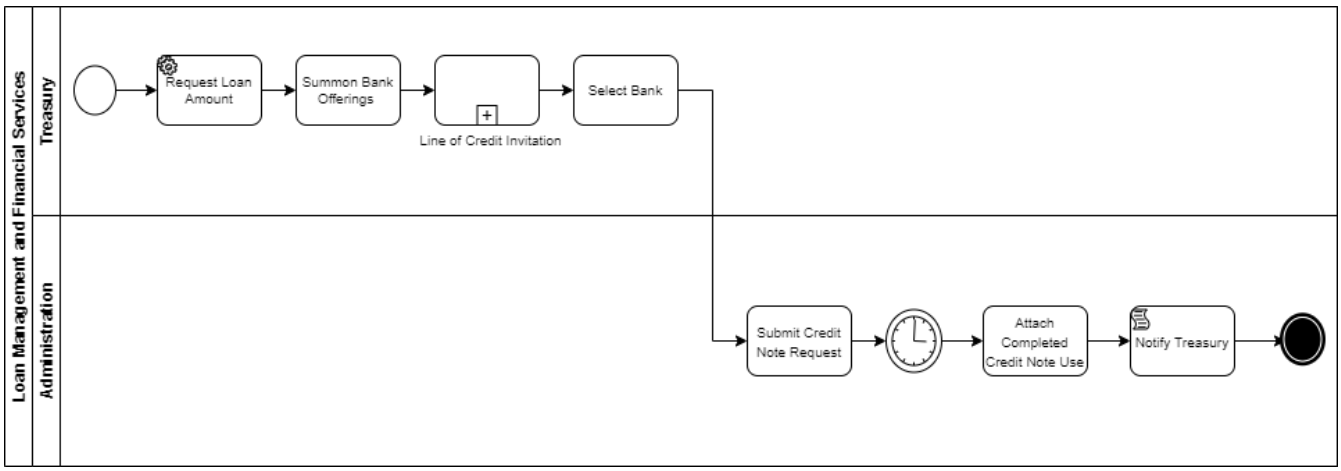

Figure 6 Loan Management and Financial Services

Once all supplier information and payment conditions have been approved, the delivery of the order onsets with suppliers and transportation intermediaries. Once the cargo arrives in the country, the main activity performed by the big-box store is receiving the merchandise as part of the delivery of goods phase, as presented in **Figure 7**. The customs agency receives the shipment and reviews the order documentation provided by the supplier. If the requirements are met, the goods are cleared and released. If the requirements are not met, the retail store is notified, and the documentation must be updated to release the cargo. Once the merchandise is released, the transportation and warehouse management of the big-box store carries the internal transportation and inspection. The procedure begins with the waybill creation and the freight transportation to the warehouse. After merchandise arrives at the warehouse, a quality inspection is performed, concluding the delivery.

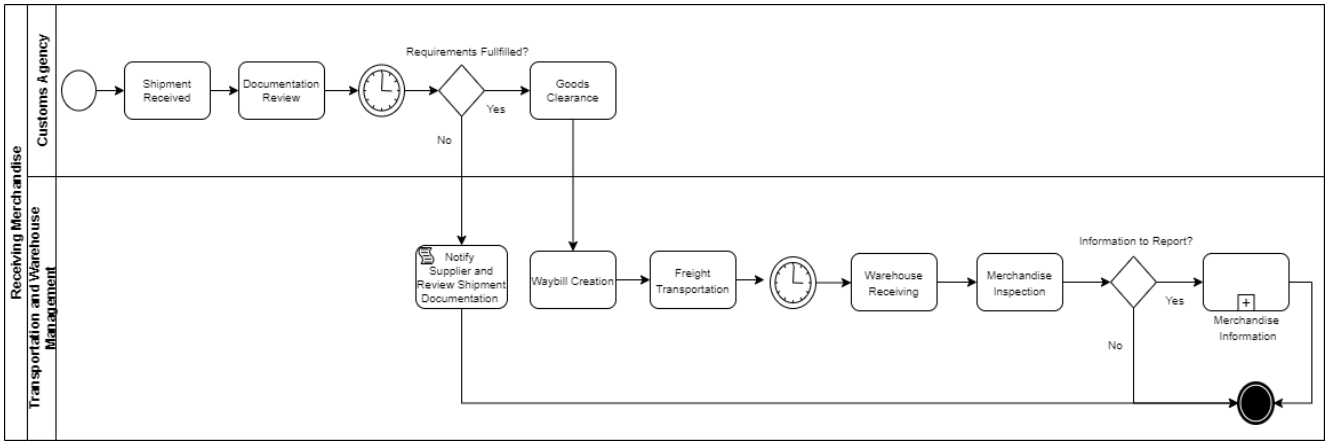

Figure 7 Receiving Merchandise

A significant reduction in the execution time of the re-design of the importations process is achieved with the time saved estimated by calculating the trivial operations no longer necessary in the activities. This evaluation was performed for this study in collaboration with the administrators for each described activity. **Table 2** reports the time savings of an overall 43% that are derived from implementing the proposed BPM modeling with a projected 30% decrease in default costs. Consequently, these projected decreases conduct to a significant reduction in storage costs for the big-box store.

4. DISCUSSION

Business process management (BPM) focuses on the knowledge, mastery, and continuous improvement of the processes and resources to control operational risks and meet organizational objectives. Our research proposed a comprehensive BPM application for the importations process on a big-box store located in Colombia, presenting difficulties with the traceability of the information and the response capability of their internal clients. The company has drawbacks with information traceability and the ability to respond to queries of internal customers (Chams-Anturi *et al.*, 2020). We developed and designed an automated BPM model, implementing a detailed graphical outline of the main phases involved to analyze the associated activities.

Table 2 Time Saved for Importations Process Phases

Phases	Actual Time (Days)	Projected Time (Days)
Suppliers management	10	6
Suppliers registry	7	4.5
Loan management	21	11
Receiving merchandise	7	4
Total	**45**	**25.5**

The proposed process flow model provides enhanced control and monitoring in real-time of all operations with the integration of its actors and envisions that the traceability of the process is accomplished in real-time, which creates the opportunity of designing timely control mechanisms. A significant reduction in the execution time of the re-design of the importations process is achieved with the time saved estimated by calculating the trivial operations no longer necessary in the phases with an overall 43% reduction in the execution times. Process modifications involve trial-and-error actions, which can cause dissatisfaction among employees who participate in the activities. For this reason, it is vital to maintain effective communication with all those involved, not only in the importations process but also with all internal suppliers and customers, to evolve consistently and efficiently when these types of disapproval situations arise. Once the big-box store implements the proposed model, managers could analyze its performance (management indicators) in real-time; therefore, personnel must evaluate facts and data to benefit from the model's advantages successfully.

The big-box store must exploit the information for improved decision-making, primarily when investing in training and technology acquisition. Providing more details on completing the process will also generate difficulties at the beginning stages since it would require greater staff empowerment under elevated levels of competence and responsibility. To develop work strategies, managers must consider and coordinate the activities needed to move forward with the new business process model (Escorcia-Caballero *et al*., 2019; Moreno-Luzon *et al*., 2019). Using the proposed BPM application, we can visualize all process phases. However, each chain member is responsible for the culture of acceptance and the strategy formation process.

The big-box store management and board of directors recognize the challenge of resistance to change. Managers are aware of the depiction required to develop attitudes and open-mindedness assessment of new scenarios (Chams-Anturi *et al.*, 2020). Process administrators of the BPM model must explicitly define the strategies for the linked business areas, which are the ones that would lead the acceptance initiative. The employees must have the disposition towards the continuous improvement of the operations. This endeavor implies having personnel for whom this challenge generates high-intensity motivation accompanied by a process aligned with a business strategy that produces a path for meeting the retail goals.

5. CONCLUSIONS

Our study details the design of a novel BPM model application to enhance the competitive advantages of the importations process in an actual big-box store. The BPM application analyzed the importations operations' actual status and evaluated the essential phases after re-designing. A significant overall reduction of the re-design is achieved with the time saved estimated by calculating the trivial operations no longer necessary in the activities. We projected the costing benefits of the BPM model in its implementation. They contemplated an overall 43% reduction in the execution times in importations activities (Receiving merchandise (42.9%), Loan management (47.6%), Suppliers management (35.7%), and Suppliers registry (40%)), with a 30%, decrease in default costs and a significant reduction of storage costs for the big-box store (according to the administrators for each activity). These reductions are substantial to the big-box store since the automation of the process will escalate the assessment in each operation, generating substantial cuts in delays and expenses.

Positive outcomes are reflected in fewer storage costs and extra fees. A significant advantage of the BPM application is that there are accurate indicators of cost overruns caused by suppliers for not sending documentation on time. These allow the cargo transporters to improve the withdrawal time of the merchandise in the port. The distribution centers will have the information on the shipments that arrive at the docks, increasing the flexibility in adjusting spaces in the warehouses to avoid taking longer loads in the ports reducing storage costs in leased locations.

The big-box store expects to present significant reductions in terms of time and costs, warranting superior control and real-time monitoring of the process, including the grander integration of administrators with the BPM implementation. We recommend developing strategies in the business area to reduce employee resistance to change through human resource training, individual-group consultations, and fostering teamwork.

REFERENCES

Aversano, L., Grasso, C. and Tortorella, M. (2016) 'Managing the alignment between business processes and software systems', *Information and Software Technology*, 72, p. 171–188.

Castillon-Mendoza, J. and Solorzano-Aranzamendi, O. G. (2012) 'Aplicación de buenas prácticas de tecnologías de información en la mejora del proceso del mantenimiento de los sistemas de información en una institución pública', *(Doctoral dissertation). Universidad Peruana de Ciencias Aplicadas. Lima, Perú.*

Cernauskas, D. and Tarantino, A. (2009) 'Operational risk management with process control and business process modeling', *The Journal of Operational Risk*, 4(2), p. 3.

Chams-Anturi, O., Escorcia-Caballero, J.P., Gomez, A.P. and Soto-Ferrari, M. (2020) 'A systematic business process management application of an imports process on a commercial company', In *Proceedings of the International Conference on Industrial Engineering and Operations Management*, p. 223-233.

Chams-Anturi, O., Gomez, A.P., Escorcia-Caballero, J.P. and Soto-Ferrari, M. (2020) 'Assessing organizational behavior: A case study in a Colombian retail store', *Ibima Business Review*, p. 1–12.

Chang, J. (2016) 'Business process management systems: Strategy and implementation', *Taylor & Fran-cis Group. New York*.

Dani, V., Freitas, C. and Thom, L. (2019) 'Ten years of visualization of business process models: A systematic literature review', *Computer Standards & Interfaces*, p. 1–26.

Danilova, K. (2019) 'Process owners in business process management: A systematic literature review', *Business Process Management Journal*, 25(6), p. 1377-1412.

Daultani, Y., Goyal, K. and Pratap, S. (2020) 'An empirical investigation of the relationship between store attributes and customer satisfaction: A retail operations

perspective', *Operations and Supply Chain Management: An International Journal*, 14(1), p. 100–110.

Escorcia-Caballero, J.P., Moreno-Luzon, M. and Chams-Anturi, O. (2019) 'Supply chain integration capability: An organizational routine perspective', *International Journal of Supply Chain Management*, 8(4), p. 39.

Fera, M., Macchiarolia, R., Fruggiero, F., Lambiasec, A. and Miranda, S. (2017) 'Application of a business process model (BPM) method for a warehouse RFID system implementation', *International Journal of RF Technologies*, 8(1), p. 57–77.

Goetz, S. and Rupasingha, A. (2006) 'WalMart and social capital', *American Journal of Agricultural Economics*, 88, p. 1304–1310.

Grau, C. and Moormann, J. (2014) 'Investigating the relationship between process management and organizational culture: Literature review and research agenda', *Management and Organizational Studies*, 1(2), p. 1–17.

Harmon, P. and Wolf, C. (2014) 'The state of business process management 2014', *BPTrends*.

Havey, M. (2005) 'Essential business process modeling', *1st ed., O'Reilly Media, Sebastopol, CA.*

Hill, J., Sinur, J., Flint, D. and Melenovsky, M. (2006) 'Gartner's position on business process management', *Business Issues, Gartner, Stamford*.

Holzmüller-Laue, S., Schubert, P., Göde, B. and Thurow, K. (2013) 'Visual simulation for the BPM-based process automation', In *International Conference on Business Informatics Research. Springer, Berlin, Heidelberg.*, p. 48–62.

Hrabal, M., Tuček, D., Molnár, V. and Fedorko, G. (2020) 'Human factor in business process management: Modeling competencies of BPM roles', *Business Process Management Journal*, 27(1), p. 275-305.

Huang, Q., Ohmori, S. and Yoshimoto, K. (2020) 'Incorporating transportation mode decisions into production-shipping planning: Considering shipping consolidation', *Operations and Supply Chain Management: An International Journal*, 14(1), p. 62–72.

Kaptelinin, V., Nardi, B., Bødker, S., Carroll, J., Hollan, J., Hutchins, E. and Winograd, T. (2003) 'Panel: Post-cognitivist HCI: Second-Wave theories', *Paper presented at the computer-human interaction, Ft. Lauderdale, Florida, USA*.

Keates, O. (2019) 'Integrating IoT with BPM to provide value to cattle farmers in Australia', In *International Conference on Business Process Management. Springer, Cham.*, p. 119–129.

Lahajnar, S. and Rožanec, A. (2016) 'The evaluation framework for business process management methodologies', *Management: Journal of Contemporary Management Issues*, 21(1), p. 47–69.

Matejaš, M. and Fertalj, K. (2019) 'Building a BPM application in an SOA-based legacy environment', *Computer Science and Information Systems*, 16(1), p. 45–74.

Do Nascimento, A., de Lima Baldam, R., Costa, L. and Junior, T. D. P. C. (2019) 'Applications of business governance and the Unified BPM Cycle in public credit recovery activities', *Business Process Management Journal*, 26(1), p. 312-330.

Sansone, C., Hilletofth, P. and Eriksson, D. (2020) 'Critical operations capabilities for competitive manufacturing in a high-cost environment: A multiple case study', *Operations and Supply Chain Management: An International Journal*, 13(1), p. 94–107.

Silva, J. C. D., Longaray, A. A., Munhoz, P. R. and Castelli, T. M. (2019) 'Using the view of Business Process Management (BPM) for process improvement in the shipping industry and offshore construction sector: A case study of the Rio Grande (RS) naval pol', *Gestão & Produção*, 26.

Simangunsong, E. and Subagyo, I. (2021) 'Investigation and analysis of omnichannel logistics models: A study in the electronic retail industry in Indonesia', *Operations and Supply Chain Management: An International Journal*, 14(2), p. 221–231.

Sinur, J. and Bell, T. (2003) 'A BPM taxonomy: Creating clarity in a confusing market', *technology*, 18, p. 9669.

Smith, H and Fingar, P. (2003a) 'BPM's Third Wave', *World War II*, (1–10).

Smith, H. and Fingar, P. (2003b) 'Business process management: The third wave', *Tampa: Meghan-Kiffer Press*, 1.

Sun, X. (2007) 'Dataflow analysis and workflow design in business process management', *(Doctoral dissertation). University of Arizona. Tucson, Arizona*.

Suša Vugec, D., Ivančić, L. and Milanović Glavan, L. (2019) 'Business process management and corporate performance management: Does their alignment impact organizational performance', *Interdisciplinary Description of Complex Systems: INDECS*, 17(2), p. 368–384.

Suša Vugec, D., Tomičić-Pupek, K. and Vukšić, V. (2018) 'Social business process management in practice: Overcoming the limitations of the traditional business process management', *International Journal of Engineering Business Management*, 10, p. 1-10.

Swan, B. (2007) 'The effects of business process management cognitive resources and user cognitive differences on outcomes of user comprehension', *(Doctoral dissertation), Virginia Tech. Blacksburg, Virginia*.

Trkman, P. (2010) 'The critical success factors of business process management', *International Journal of Information Management*, 30(2), p. 125–134.

Tsagkani, C. and Tsalgatidou, A. (2022) 'Process model abstraction for rapid comprehension of complex business processes', *Information Systems*, 103, p. 101818.

Van der Aalst, W. (2004a) 'Business process management: A personal view', *Business Process Management Journal*, 10(2).

Van der Aalst, W. (2004b) 'Business process management demystified: A tutorial on models, systems and standards for workflow management', *Lecture Notes in Computer Science, Lectures on Concurrency and Petri Nets*, 3098, p. 1–65.

Van der Aalst, W., Ter Hofstede, A. and Weske, M. (2003) 'Business process management: A survey', *Proceedings of the International Conference on Business Process Management. Eindhoven, The Netherlands,* p. 1-65.

Wang, M., Wu, Y., Chen, B. and Evans, M. (2020)

'Blockchain and supply chain management: A new paradigm for supply chain integration and collaboration', *Operations and Supply Chain Management: An International Journal*, 14(1), p. 111–122.

Zhang, L., Long, Y., Chao, T., Chang, H. and Sayah, J. (2004) 'Adaptive integration activity management for on-demand business process collaboration', *Information Systems and E-Business Management*, 2(1), p. 149–166.

ZhenHua, W., Yousen, H., ZiYun, D. and Wei, Z. (2009) 'SOA—BPM based information system for promoting agility of third party logistics', *In 2009 IEEE International Conference on Automation and Logistics*, p. 248–252.

Zota, R. and Ciovica, L. (2015) 'Designing software solutions using business processes', *Procedia Economics and Finance*, 20, p. 695–699.

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