Article

The Creation of a New Supply Chain Management Process as a Tool for Creating Value in the B2B Market

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Received: 11 June 2025; Revised: 28 September 2025; Accepted: 10 October 2025; Published: November 3, 2025

Abstract: This study presents a solution to problems in the company Alpha's supply chain management by implementing an integrated information system that improves operational efficiency, reduces costs, and optimizes resource management. The solution, developed using Design Science Research (DSR) method, explored the opportunity to create value for the company and its customers in the steel sector, contributing to the business strategy through an innovative supply management model that proved to be more efficient. The impact was significant in terms of internal efficiency and customer satisfaction, consolidating the creation of value for both the company and its customers. The solution also had positive social impacts, including the improvement of business relationships, strengthening of customer loyalty, and professional development.

Keywords: design science method; information system; supply chain; value creation

1. Introduction

In the contemporary business scenario, the pursuit of competitiveness and sustainability has become a priority for organizations, especially in the refractory industry, which supports steel production by providing essential materials for the steel manufacturing process. The efficiency and effectiveness of logistics processes in this industry are vital for supplying a continuous and reliable stream of these materials, as well as for meeting the specific demands of customers in the steel sector. According to Pardini and Matuck (2012), to change their practices and processes to keep pace with technological changes, many organizations are turning their attention to innovation in the supply chain management process.

In this context, integrated supply chain management emerges as a key strategic tool for optimizing operations, reducing costs, and differentiating oneself in the market. The justification for this work is based on the importance of the company's business strategy, which aims to offer innovative solutions to its customers through a diversified portfolio of products. This strategy employs a model of close customer relationships, offering customized products tailored to their specific needs. Increasing geopolitical volatility, such as trade tensions and regional conflicts, coupled with disruptive events like pandemics, significantly affects the availability and costs of materials and components (Herold & Marzantowicz, 2023).

According to Ross (2016), supply chain management must be agile to cope with uncertainties and fluctuations in demand, quickly adapt operations to meet new requirements, and ultimately satisfy customer needs by ensuring that products are available in the correct quantity, at the right time, and in the right place. However, the challenges associated with the flow of goods along the supply chain in the current global scenario are marked by a combination of complex and interconnected factors, which necessitate a supply chain response (Richey et al., 2022). Faced with

this challenging scenario, Nujen et al. (2018) emphasize that organizations must refine their supply chain strategies by adjusting their knowledge and capacity to mitigate the risks of missing out on new opportunities for products and markets.

Strategical design information disclosure in the supply chain allows companies to manage misaligned interests, optimize production decisions, and overcome the limitations of other simple information sharing approaches, which can lead to a more efficient and lower-cost supply chain (Candogan & Gurkan, 2025).

Digital platforms enable the strategic integration of multiple entities and cutting-edge data-driven decision-making, providing real-time insights into logistics movements, demand forecasting, production planning, and inventory levels. Real-time visibility facilitates better decision support, resource utilization, productivity, and profitability, for instance, in global supply chains (Tiwari et al., 2024).

The refractory industry plays an essential role in the steel industry to supply materials that withstand extreme temperature and corrosion conditions in steel production processes. Given the increasingly stringent demands for efficiency, quality, and competitiveness, effective supply chain management becomes a necessary element for the success and sustainability of companies in this sector. Also, the supply chain in the steel refractory industry is complex and highly interdependent, involving multiple stages, from the acquisition of raw materials to the delivery of the final product to the customer. In this context, integrated logistics chain management emerges as a determining factor for optimizing processes, minimizing costs, and maximizing operational efficiency (Araújo et al., 2014).

One of the main challenges faced by refractory companies is the need to maintain a continuous and reliable supply of high-quality raw materials amidst the complexity of the logistics chain. Sartori et al. (2017) highlighted the importance of inventory control in the steelmaking process as a contributing factor to improving organizational performance. Given the operational complexity of the steelmaking process, efficient coordination between suppliers, manufacturers, and customers is essential to ensure the timely delivery of products and services, avoiding interruptions to production processes in steel mills (Araújo et al., 2014).

The research was conducted at Alpha, a multinational industrial engineering company and a global leader in molten metal flow engineering and technology and offers customized products, solutions, and services from production facilities close to customers. The organization has more than 40 factories, five research and development (R&D) centers, and over 60 sales offices worldwide, with over 10,000 employees.

Alpha occupies a unique strategic position in Brazil as an essential supplier of inputs and technological solutions for the steel industry, a key sector of the economy, with a significant impact on exports and industrial development. The diagnosis of this study revealed a significant opportunity to optimize the current supply chain management model at Alpha, reinforcing the already high quality of the products and services offered by the company.

This work aimed at developing a new process for supply chain management as a tool to create value for the company being studied. Analyzing the importance and benefits of integrated supply chain management in the steel refractory industry, with a special focus on innovation as a key driver of value creation. Through a multidisciplinary approach that integrates concepts of logistics, supply chain management, process engineering, and innovation, it seeks to identify opportunities to improve logistics processes and explore new ways to create value for customers, thereby differentiating itself in the market through an integrated logistics chain management model.

2. Digitalization in supply chain management

Authors such as Soroor et al. (2009) argue that supply chain optimization is only possible through the support of information systems (IS): Lewis and Talalayevsky (2000), in turn, define an information system as a set of information technology elements (software, databases, and others) organized for a specific purpose, supporting the decision-making process.

An IS can be defined as the integration of information technology elements structured with a specific objective. These systems are involved in the process of data collection, storage, processing, and information sharing, serving as a tool to support management and decision-making (Ribeiro et al., 2019). These IS allow organizations to develop new capabilities that would otherwise not be possible: for instance, digital innovations applied to supply chain management expand the capacity to improve demand forecasting, inventory management, and better visibility into the performance of the chain itself (Mbonu, 2025).

Information management capability is an essential resource for an organization and is crucial to improving company performance and it allows an organization to enhance its resources and capabilities in conjunction with external resources for the mutual benefit of supply chain network members. It depends primarily on company procedures and data management and must incorporate the IS into business processes (Alagarsamy et al., 2025).

Turban et al. (2007) emphasise that the IS plays a fundamental role in helping to integrate and coordinate the activities of different agents involved in the supply chain, facilitating communication and the exchange of information between different stakeholders, such as suppliers, manufacturers, distributors, and customers and ensuring that all participants have access to the information necessary to make decisions.

Furthermore, the IS helps manage and control the flow of materials and products throughout the supply chain, providing gains and efficiency and helping to forecast and manage demand, ensuring that inventory levels are adequate to meet customer needs. This integration provides efficiency gains in processes, highlighting the importance of information at all levels of decision-making (strategic, tactical, and operational) for the development of business environments and the supply chain.

Brum (2016) emphasizes the importance of carefully considering the implementation of a supply chain management system: for the IS to function harmoniously and effectively, it is necessary to overcome the lack of collaboration and develop a detailed and well-structured plan. The implementation of technologies that support supply chains can bring benefits such as improved decision-making and cost reduction, but it also highlights significant challenges, such as a lack of digital skills among system users, resistance to change when abandoning traditional technologies and work practices, connectivity issues, high acquisition and implementation costs, lack of institutional support, bureaucracy, and complex regulations (Semkunde, 2025).

For the successful implementation of an innovative solution that changes the current structure of a customer service chain management process, it is important to adopt a structured and comprehensive approach. According to Micu and Necula (2018), this includes clearly defining the objectives of the change, transparent and continuous communication with all stakeholders, active involvement of leaders and employees, identification and mitigation of resistance, provision of appropriate support and resources, and constant evaluation and adjustment of the process. By prioritizing a culture of openness, flexibility, and organizational learning, companies can navigate change effectively, driving innovation, growth, and competitive advantage.

3. Materials and Methods

The research developed in this study was grounded in the principles of the Design Science Research (DSR) methodology. For Wambsganss et al. (2020), the DSR is a scientific method that enables the solution of practical problems faced by professionals and researchers in their professional and academic practices. Thus, the choice of the DSR to direct the work was based on the ability to apply the method in solving problems and taking advantage of practical opportunities, in addition to contributing to general knowledge. The Design Science Research (DSR) Methodology offers a solid framework for developing innovative artefacts, such as business processes, that meet the demands of the business world. This study adopted the structure outlined by Aken et al. (2012) presented in Figure 1 and which can be used for problem situations, or opportunities, in organizations.

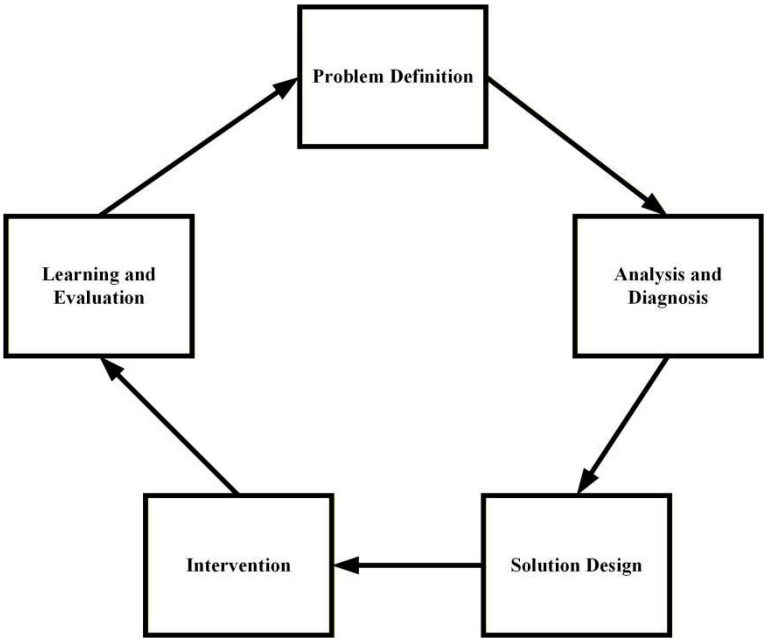

Figure 1. Project Process Model

Source: Aken et al. (2012).

The cycle begins with understanding the investigated situation. This stage concerns the focus of the project, that is, the situation intended to be solved as a problem and/or the opportunity intended to be explored.

Once the problem or opportunity is identified, it is followed by analysis and diagnosis. At this stage, it is necessary to conduct an in-depth analysis to understand the root causes and impacts, which may involve gathering more information, conducting additional research, or utilizing specific analysis tools.

To carry out the diagnosis, a quantitative analysis was conducted using data from the customer satisfaction survey. This survey is emailed annually to all customers by the company's Quality Assurance Department and has achieved an approximately 80% response rate among a group of 22 customers.

The survey aimed to assess customer satisfaction with the product's performance, the resolution of technical problems, the sales representative's interaction, and the level of service in meeting deadlines. The survey assesses customer satisfaction with the aforementioned aspects using a five-point Likert scale, and each survey item includes a field where customers can provide their perceptions of the item evaluated. This field allowed researchers to qualitatively analyze customer perceptions of the survey items. Once all the pertinent information has been analyzed, the diagnosis is concluded, providing the opportunity to propose a solution to explore the identified opportunity. At the end of the solution projection, the planning and execution stage of the intervention begins, a phase that involves creativity and innovation, in which different approaches are considered to achieve the desired goals.

The cycle concludes with the evaluation stage: to assess the effectiveness of the implementation and quantify its impact on the company's operations, the evaluation of the intervention sought to identify areas for improvement, thereby supporting the continuous refinement of the proposed solution.

The evaluation included the quantitative analysis of performance indicators (KPIs) to assess operational efficiency. Relevant KPIs were selected to monitor the impact of the solution, such as reduction of time of the sales teams in logistics activities, improvement in the service level (OTIF – On time in Full), order cycle time (Lead Time), urgent order index, days of inventory coverage and Accuracy in Demand Forecast (Forecast Accuracy). Data was collected at regular intervals (weekly and monthly) during and after the system's implementation, according to the characteristics of the

indicator in question. The collection took place across all operational areas impacted by the system, including sales teams, logistics, supply chain, and distribution centres, as well as inventory in branches and other areas. Reports extracted directly from the implemented IS, performance dashboards, and regular reports of the processes involved were used as well. There was no need to use advanced statistical methods to analyze the data in this study, since the researchers were only looking for descriptive results about the satisfaction of the company's customers.

After evaluating the solution in the company, a final reflection is conducted on the entire process, enabling the identification of lessons learned, areas for improvement, and opportunities for ongoing learning.

3.1 The Research Unit

The research was carried out at the Brazilian unit of the company ALPHA, whose company name was anonymized at the request of the company leaders, a multinational organization in the technological solutions sector for the steel and foundry segment, a global reference in providing engineering and technology solutions for metal fabrication. The company adopts a strategy focused on offering innovative solutions of high technological quality, providing products and services that help customers make their industrial processes safer, more efficient, and sustainable.

Alpha is a global group with a business model centered on offering customized products, solutions, and services from production facilities located near customers. The Research Centers are designed for research and product development, and they are strategically located across regions such as NAFTA, Europe, and China, organized by product division. The development and improvement of processes, in turn, are topics addressed and developed by the regional business units.

A relevant point that makes Alpha unique in Brazil and justifies research on it is the fact that it is one of the few multinational companies that are global leaders in refractories and flow control for the steel and foundry industries with local production and integration into the Brazilian industrial chain. Specifically, in Brazil, Alpha stands out by: a) providing critical solutions for the steel industry (such as liquid steel flow control systems, refractories, and high-performance materials), b) directly serving major players in the sector who depend on stable and safe steel production processes.

Also, Alpha is known for investing in technologies that increase energy efficiency, reduce steel losses, and extend the life cycle of its refractory products, which establishes it as a benchmark in industrial sustainability. In terms of strategic performance in the global refractory production chain, Brazil is one of the largest steel producers in Latin America, and Alpha's presence in the country connects the local industry to best practices and global innovations in refractories. Furthermore, the high-performance refractory sector requires technical know-how, certifications, production scale, and strong relationships with strategic customers. Few companies in Brazil can compete at this level, which makes this company relevant for conducting studies of this nature.

As an operating strategy, Alpha has experts in the sector who work on-site at customers' facilities, allowing for an ideal position to collaborate with customers in identifying their needs and potential improvements in services and processes. The company is present to the customer through its stores (branches), the physical representation of local agents, who are the Key Account Managers (KAMs), and a technical body of specialists. In the supply process, these branches serve to store products and deliver them to customers for consumption. ALPHA supports demand planning and supply, providing technical services to customers. This relationship is established through a contract, ensuring mutual responsibility between the parties.

4. Results and Discussion

4.1 Diagnosis of the Situation

The results of the evaluation regarding the commercial relationship, the quality of solving and conducting problems, the performance of the product, and the fulfilment of required deadlines are presented in Figure 2.

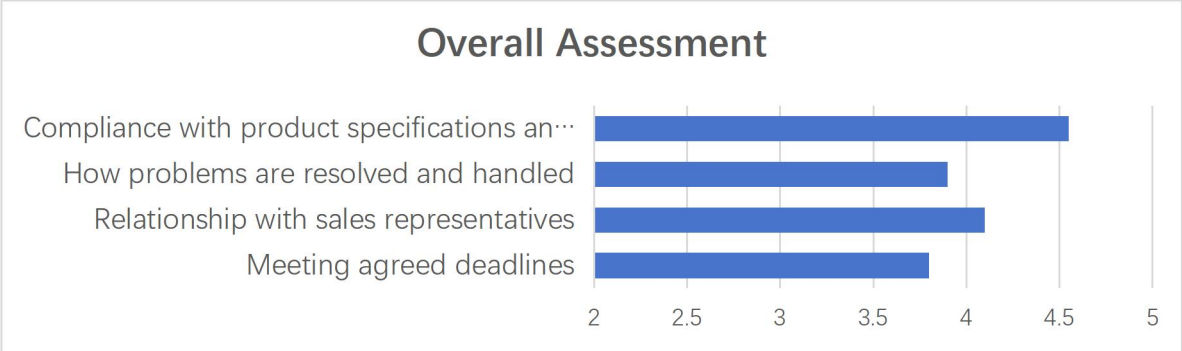

Figure 2. Overall Average Customer Satisfaction Rating.

Figure 2 presents a comparison across all categories, facilitating visualization about the two main points of opportunity: improving compliance with agreed-upon deadlines and enhancing the resolution of operational problems at the customer.

The data presented indicate a level of customer satisfaction regarding the product's performance and the relationship with the commercial representative. In the comment fields of the survey, it is possible to identify this perception through comments highlighting the quality of products and services, as well as the relationship with the commercial team.

- [...] "We are very satisfied with lpha with both the products and the local technical assistance."
- [...] "Trade talks are very mature and usually bilateral. We have problems, but they are resolved in the best way for both parties."

The survey revealed a lower evaluation of the way problems are addressed and handled. In the comments of some customers, it is possible to identify dissatisfaction with the local presence of technical support. We highlight two comments that demonstrate this perception:

- [...] "Deficient Technical Assistance and delay in responding to problems. ALPHA sins in the delay in solving problems, it is always far from the problems."
- [...] "The competitor has Technical Assistance more present in the day-to-day production, facilitating analysis and decision-making in occurrences with materials. The specialists/technicians have vast knowledge; however, their absence from daily operations hinders effective performance evaluation and monitoring. The competitor has this differential."

According to some customers' perceptions, the company does not stand out in the market in terms of its technical support compared to the competing companies.

Figure 2 shows an overall average score of 3.8 points of satisfaction (76%) about meeting the required deadlines, and when it was compared to the other categories of the survey, this aspect has the lowest evaluation, which facilitates the identification of improvement opportunities in the supply chain management process. Additionally, another customer added another comment in the survey responses:

- [...] "The case involving the low stock level of the BETA product (contract item), which caused a lot of apprehension and risks of stockouts, is a classic case of failure in materials management."
- [...] "In terms of the Y product line, Alfa has excellent service. However, in the part of product line, I see room for improvement, especially from the point of view of flexibility and speed in service times."

In general, the data collected indicated that customers expressed a high degree of satisfaction regarding the quality of the products and the maturity of commercial negotiations. However, the analysis revealed critical areas of opportunity, especially in the efficiency of technical support and the management of delivery times, where Alpha was perceived as inferior to its competitors. These findings suggest the need for targeted interventions to enhance the company's ability to better meet customer expectations.

Key Account Managers, who are essential for maintaining service excellence, currently dedicate a considerable portion of their time to administrative activities, such as product supply control. By reducing this burden, they can focus on their core functions, raising the level of service provided and maintaining the high standard for which the company is already known.

These results demonstrate that although it is not a structural problem, they present a clear opportunity for improvement. Despite the company's operational success, as reflected in healthy financial results, a strong market and customer reputation, there is an opportunity to enhance logistics management further. This opportunity may minimize negative customer perceptions and create an opportunity to stay ahead of the competition and build the best customer experience. It can function as a replicable and innovative process model, with the potential for implementation in the company's global divisions and in other businesses worldwide.

Therefore, the envisioned opportunity consists of restructuring processes, implementing an integrated system, automating and standardizing processes, as well as utilizing new technologies to enhance the company's overall performance.

4.2 Proposed Solution

Based on the identification of opportunities and the causes that impact the effectiveness of the service, a proposal was developed focused on short and medium-term alternatives to improve the level of compliance with deadlines and inventory management. The proposal aims, first and foremost, to reduce the administrative effort currently required of the field team, freeing them up to focus on their core functions. By reducing the workload related to logistics management, the field team will be able to dedicate more time to on-site service, thereby strengthening customer relationships and offering more effective and personalized support.

The proposal aims to revise the current process to enhance organizational efficiency, support more effective management, and improve operational visibility. These improvements are expected to enable the organization to respond more rapidly to demand shifts and consumption changes at the endpoint, while also addressing disruptions and fluctuations in the supply chain with greater agility and precision.

The central objective of the proposal is, therefore, twofold: to optimize logistics processes to increase operational efficiency and, simultaneously, to enhance the quality of the service provided. By freeing up human resources and time, the company will meet deadlines more efficiently, improving its overall productivity. However, it will also allow the field team to become more actively involved in customer operations, promoting improvements in production processes and strengthening the organization's business strategy.

Incrementally, the integration of the logistics chain through an information system will enable to collect and analyze data more efficiently and accurately, providing valuable information for decision-making, identifying opportunities for improvement, optimizing processes, and predicting demands more accurately. This incremental factor improves the efficiency and quality of service and contributes to more strategic and informed management, thereby strengthening the company's competitiveness in the market. Figure 3 presents the flowchart of the proposed solution: it is possible to identify the scope of action in the context of the integrated management software.

The proposed Supply Chain Management Information System (IACS) will use SAP Integrated Business Planning (IBP) as a tool to support the process. SAP IBP is an advanced business planning solution offered by SAP, one of the world's largest management software companies.

Process automation and supply chain task optimization are facilitated by the right IT infrastructure and lead to reduced decision-making time, decision support, and ultimately faster response times and increased process throughput (Khalifa et al., 2021).

In the new model proposed for the Alpha company, the demand planning process begins with data collection, the integration of information via the system, and visualization through the SAP IBP platform, which can be accessed via an application in Microsoft Excel™. The system, in turn, proposes statistical models, allowing analysts to make manual adjustments and corrections, as well as facilitating collaboration between the sales, marketing, and logistics teams. Teams can share information about upcoming events, market insights, and other factors that affect demand. Based

on the consolidated sales demand forecast, the system plans the future demand for the products as well as the demand for the other stages of the supply chain and inventory.

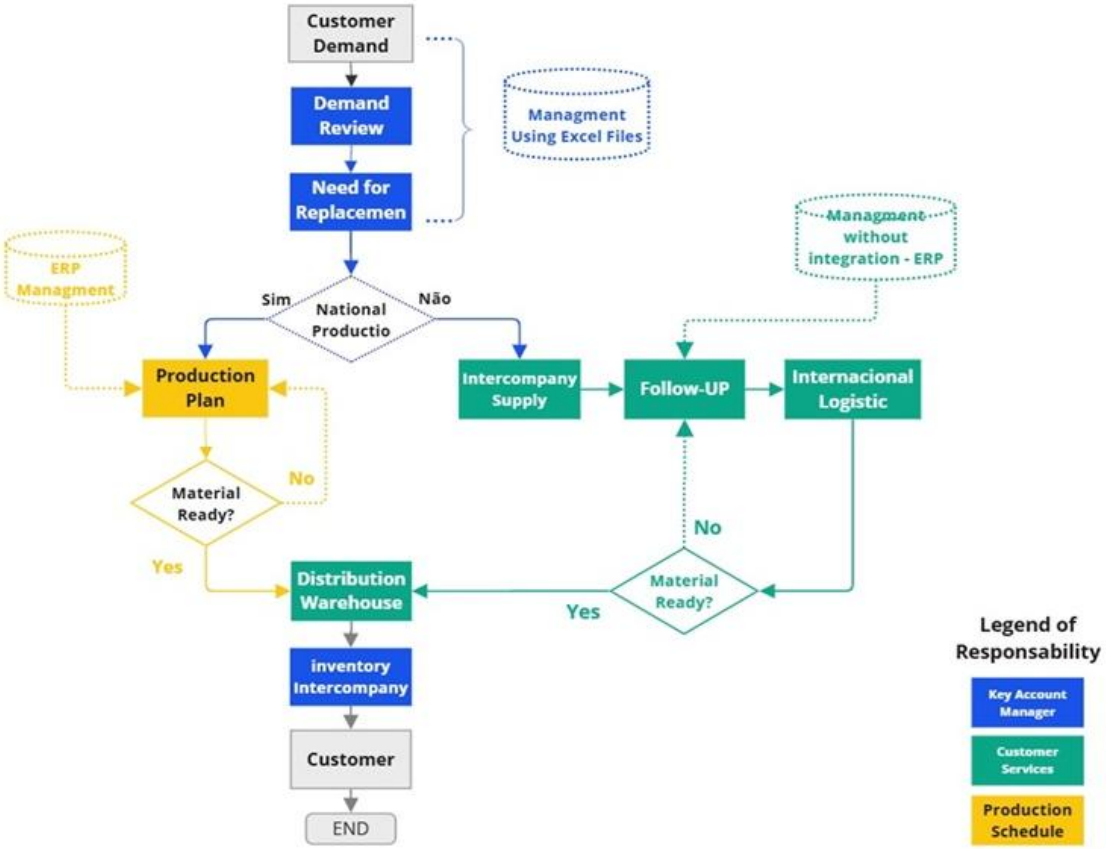

Figure 3. Supply Process Flowchart – Future State

The supply planning process, on the other hand, uses SAP IBP to calculate supply requirements based on the company's forecasted demand, constraints, and inventory policies. The SAP system uses advanced algorithms to optimize planning, ensuring that products or services are available when and where they are needed while minimizing operational costs and it contributes to enhanced operational efficiency, shorter delivery lead times, and reduced operational costs.

Based on the demand and inventory information, the system calculates the net requirements using a predefined heuristic rule. These rules enable the definition of the quantity that must be produced or purchased to meet the expected demand, which involves economic lot calculations, order points, and other relevant parameters.

SAP IBP utilizes advanced algorithms to optimize supply planning, considering constraints such as production capacity, supplier lead times, and logistics costs. It generates detailed supply plans to meet needs effectively and cost-effectively.

Collaboration with suppliers is facilitated by the platform, enabling the exchange of information on orders, deadlines, and material availability. The platform enables real-time monitoring to track the execution of supply plans, facilitating the detection of deviations and the implementation of immediate corrective actions. For process management, reports and advanced analysis are generated, allowing managers to evaluate the performance of supply planning and identify areas for improvement. The proposed new system utilizes SAP IBP to provide specific tools and functionality, helping the supply chain team plan their inventory effectively.

Based on the aforementioned data collection, the system provides real-time visibility of inventory levels, as well as projections informed by demand data from previous planning cycles. It enables the configuration of inventory policies through the definition of key parameters, such as safety stock, reorder points, economic order quantity, and minimum stock levels. These policies

support the determination of optimal replenishment timing and quantities. The platform utilizes advanced algorithms to optimize inventory levels, minimizing excess inventory while ensuring product availability is met, and it helps reduce storage costs and improve the utilization of working capital.

4.3 Intervention

The implementation of the Information System for Supply Chain Management brings significant changes, both operational and technological, to the company's current model. The implementation of technologies that support supply chains can bring benefits such as improved decision-making and cost reduction, but it also highlights significant challenges, such as a lack of digital skills among system users, resistance to change when abandoning traditional technologies and work practices, connectivity issues, high acquisition and implementation costs, lack of institutional support, bureaucracy, and complex regulations (Semkunde, 2025).

Modern supply chains face several complex challenges, especially in an increasingly globalized, multifaceted, and volatile world: these challenges often undermine trust among stakeholders, which is a key factor in successful supply chain management and building sustainable, resilient, and viable supply networks (Herbe et al., 2024).

Following model validation, a progressive implementation approach was adopted, combined with continuous monitoring and ongoing performance evaluation. These actions enable the organization to optimize its operations and benefit from the technology's functionalities without compromising operational continuity and risking supply disruptions to customers.

The implementation took place progressively, prioritizing strategic customers and facilitated control, allowing the lessons learned in the pilot test to be applied. Consequently, the knowledge gained from each new customer can be applied to subsequent customers.

To mitigate the risks to supply during the transition, it was decided to simultaneously maintain the previous supply management model while the new system was implemented and developed. This strategy enabled the supply to continue uninterrupted, ensuring the continuity of operations while adjustments and improvements to the new system were implemented. The previous model worked as a contingency measure, providing safety and flexibility until the new system was fully validated and integrated into the operation.

One of the main challenges to improving the project's outcome was to ensure that all individuals were fully empowered to use the new system effectively and understand their responsibilities within the new process. To achieve this, in addition to offering general training on the system's functionalities and navigation, it was necessary to conduct practical sessions focused on critical areas, particularly for the Supply Chain team and Key Account Managers. These sessions covered specific topics, including inventory management, demand planning, and order tracking, addressing the technical aspects and operational best practices.

A training workshop was organized for all those involved in using the new tool. This training workshop lasted three days and took place at the company's administrative headquarters in South America. In addition, training was conducted directly with the field teams at the customers' facilities, aiming to improve the understanding and integration of local activities with the new process' functionalities. Additionally, remote meetings were conducted via communication platforms and videoconferences. Additional training for the Supply Chain team took place both face-to-face in the office and remotely, providing flexibility and greater reach.

To ensure the accuracy of the information, specific actions were implemented. The first of these was the implementation of a physical verification process for the field inventory, ensuring that the data in the system accurately reflected the actual inventory. This verification was necessary to eliminate discrepancies between physical and digital inventory, thereby minimizing potential operational errors.

Additionally, the Key Account Managers' team conducted a validation of customer demand in collaboration with the implementation project management team. In this process, monitoring was conducted to verify that the reported demand aligned with historical forecasts and was validated through the collaborative demand planning process. Subsequently, a detailed analysis was

conducted to verify the accuracy of these forecasts, enabling continuous adjustments and ensuring the estimates were realistic and based on concrete data.

Another key aspect was the implementation of logistics controls. These controls were intended to allow the accuracy of information on materials in transit, both nationally and internationally. The backlog of orders for local manufacturing was monitored, as well as stocks at the group's units located in strategic regions, including China, Europe, and countries of the NAFTA bloc. This approach enabled a more accurate understanding of the flow of materials and global demand, leading to more efficient supply chain management.

After the validation and adjustments in the new supply management system, it was necessary to standardize the processes established with the Information System for Supply Chain Management. The standardization of the new process has enabled procedures to be carried out consistently throughout the organization, ensuring that all employees follow the same procedures and minimizing variations and uncertainties. This predictability in processes is essential to ensure efficiency, as it provides clarity on the actions to be taken in different situations.

The standardization of the new process was carried out in an integrated manner with the company's Quality Management System (QMS), ensuring that all changes implemented adhered to the standards and guidelines established in the Quality Policy, as required by the ISO 9001 certification. Initially, an analysis of the existing processes was conducted to identify the steps that needed adjustments and improvements. This analysis included the evaluation of key processes, such as demand planning, inventory management, and supply planning, to eliminate redundancies, automate tasks, and align processes with best practices in the relevant sectors.

Once the improvements were identified, new standard operating procedures (SOPs) were developed, documenting each step of the processes and defining responsibilities for each area involved. These SOPs have been integrated into the company's QMS so that they can be audited and regularly monitored to enable compliance and continued performance. The documentation included flowcharts, checklists, and good practice guides, facilitating a uniform understanding and application by all employees.

Standardization eliminated unnecessary steps, reducing waste and optimizing the workflow, which also facilitated the training of new employees, making the process more agile and effective. Another important benefit is the guarantee that products and services comply with the standards of the Quality Management System, promoting consistency and excellence in all operations.

4.4 Evaluation

Some authors (Constantin et al., 2025) declare that digitization of supply chains acts as a strategic driver for trade openness and competitiveness, primarily through digital connectivity and the development of human capital capable of using technologies. Furthermore, the digitization of supply chains is essential for reducing transaction costs, facilitating e-commerce, and integrating companies into global supply chains, in addition to improving innovation and productivity in various sectors.

The evaluation of the information system implementation for supply chain management in the Alpha company revealed significant advances that contributed to improving the level of service and operational results, making it possible to verify the creation of value for the business.

The analysis of performance indicators (KPIs) demonstrated a significant reduction in the time that field teams dedicate to logistics activities. This reduction enhances operational efficiency while also freeing up more time for Key Account Managers to focus on strategic activities, including sales, post-sales technical support, and strengthening customer relationships. The control of hours dedicated to logistics activities enabled a reduction of approximately 25% in the cost of labour hours associated with the commercial team's supply management activities in the field. Although cost reduction has been a key focus, due to the maturation stage of the process, restructuring of the field teams has not yet begun. Once implemented, this restructuring has the potential to yield significant benefits for the project, further enhancing operational efficiency, as demonstrated in the economic analysis of the solution.

The improvement in OTIF (On Time In Full) service rates during the evaluated period reached a 4% growth. The index increased from 81% to 85%, highlighting the company's ability to meet customer expectations and reflecting its commitment to the quality of the service provided. In terms of order cycle time (Lead Time), the implementation of the new system has enabled a 2% reduction in delivery time so far. This evolution enables orders to be processed and delivered more quickly, resulting in combined benefits that increase customer satisfaction and enhance the company's competitive position in the market.

Nagy & Szentesi (2025) reports that digital technologies are fundamental to improving agility and quality in supply chain management, which can transform every link in the value chain: some features for effective digital technologies for supply chain agility and quality may include: a) real-time data analytics; b) predictive analytics using big data (historical sales patterns, market trends, weather conditions, social indicators, among other variables) to predict changes in demand and potential disruptions before they occur, avoiding stockouts and optimizing inventory allocation.

Demand Forecast Accuracy, measured by the accuracy of customers' consumption forecasts, has not shown significant improvements, indicating that there are still opportunities to improve this process. However, the tool used stands out for highlighting these gaps, something that was not possible to identify in the previous model, where the inefficiency of demand planning was not adequately dimensioned and monitored.

The financial analysis revealed substantial improvements in the company's working capital management. The improvement in Inventory Turnover indicated that the company is becoming more efficient in rotating its inventories, resulting in a lower need for fixed capital in products. It is estimated that the project contributed to a reduction in inventory of between 6 and 12 million reais, positively impacting the organization's financial health. Additionally, the Average Storage Period has been optimized, enabling the company to maintain adequate inventory levels while preserving liquidity. The 5% reduction in inventory obsolescence costs demonstrated an improvement in product management, minimizing financial losses associated with unsold items. Although the company regularly monitors these indicators, and the observed period coincides with the project's implementation, it is essential to consider that other parallel actions have also contributed to the reduction of obsolete inventory and the improvement of efficient inventory management. The project was a leader in these initiatives, although it should be seen as part of a joint effort with the actions already underway.

Logistics cost controls, including air shipments and emergency freight, were monitored, revealing a 20% reduction in overall operating costs. However, the analysis of the costs associated with rush orders and production overtime has not provided a clear picture of the previously existing inefficiencies that impact production costs and it is necessary to maintain control and monitoring of the indicator to identify opportunities for further optimizing processes and reducing unnecessary expenses. Figure 4 presents a synthesis of the results related to the indicators assessed following the organizational intervention.

Therefore, the implementation of the new information system has improved operational efficiency, reduced costs, and optimizes resources, enabling the company to offer quality products at more competitive prices. The results of this study align with Alagarsamy et al. (2025), which advocates that better information management leads to superior company performance, and it can be achieved by incorporating advanced technologies to improve the information available to managers in companies.

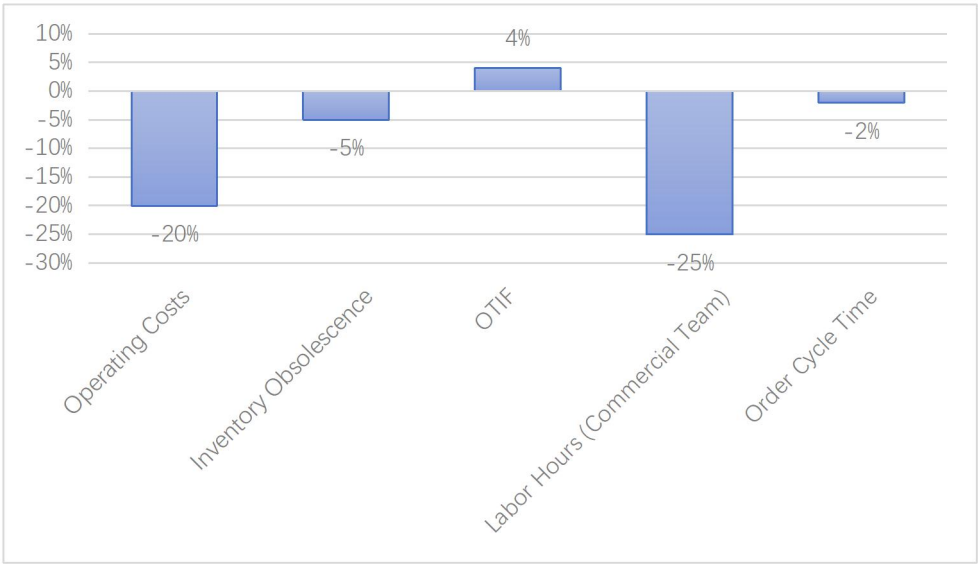

Figure 4. Business Performance Improvements

5. Conclusions

In general, this study fulfils its objective of creating a new supply chain management process as a tool for creating value in the B2B market. Additionally, it presents a clear path for other organizations seeking to transform their logistics practices, ensuring relevance and competitiveness in the global scenario. This study has demonstrated that pursuing innovation in supply chain management plays a critical role in generating strategic value for the organization.

The organization's primary goal is to create value for its customers in the steel industry by offering solutions through a diverse portfolio of products. To this end, the company maintains a close relationship model, which enables it to provide customized products tailored to the specific needs of each customer. The new supply chain management process, analyzed as a value-creation tool for the company, contributed to the efficiency and effectiveness of the supply process for the customer. The expected objective was satisfactorily achieved.

The survey underscored the relevance of integrated logistics chain management in the refractory sector applied to steelmaking, highlighting innovation as a central driver of competitiveness and operational efficiency. Furthermore, innovation was identified as a key enabler of customer value creation and a strategic lever in the pursuit of customer success. Through the detailed analysis of logistics processes along the value chain, opportunities for improvement were identified that, when implemented, allowed for solving operational bottlenecks and optimizing service to meet customer demands. The results obtained demonstrated that integrating new technologies and adopting innovative practices can generate significant improvements in internal efficiency and customer experience. In this way, the work contributes to the advancement of logistics practices in the B2B context, offering valuable contributions that other companies in the sector can apply.

This work makes a practical contribution to logistics management in the refractory industry, highlighting the particularities of Alpha's business model. This model encompasses a complex supply chain composed of multiple links and intermediaries, including several national and international suppliers, as well as local manufacturing and globally distributed group units. The high fluctuation of demand and the need for strict inventory control to mitigate the costs of invested capital are additional challenges of this multifaceted structure. As a result, several uncertainties arise that require attention and practical strategies to overcome. The proposed model demonstrated efficiency in integrating the chain, providing greater agility and clarity in information, facilitating management and decision-making processes, and optimizing resource utilization.

The implementation of the solution at Alpha resulted in significant advances on several fronts, directly contributing to operational efficiency, cost reduction, and an improvement in the level of service provided to customers. Throughout this work, the primary impacts of the solution on the company's internal processes were evaluated, particularly in terms of optimizing resource utilization, enhancing service rates, and improving demand monitoring accuracy. These results consolidate the project's success, demonstrating the creation of value for both the company and its customers.

Among the main results obtained, the reduction in the time dedicated by field teams to logistics activities and the improvement in working capital efficiency stand out, primarily through the optimization of Inventory Turnover and the reduction of costs related to product obsolescence. These advances reflect a more agile and assertive environment in decision-making, with positive impacts on the organization's competitiveness in the market.

The innovative approach stands out for leveraging cutting-edge technologies in combination with the principles of the Design Science Research methodology, which enables an agile and customized adaptation to the company's needs. By eliminating repetitive operational tasks and providing greater integration between field teams and the supply chain area, the proposal generates a direct impact on operational efficiency while freeing up resources for more strategic focuses, such as improving customer relationships. This combination of factors positions the solution as a competitive differential, with the potential to be replicated in different contexts and sectors.

The implementation of the information system to manage supply to customers brought significant results to the company, both in operational and financial terms. The proposed solution enhanced internal efficiency and customer satisfaction while also generating significant value for the business by freeing up resources for investment and optimizing critical processes. These results foster growth, job creation and generate new business opportunities both domestically and internationally.

The optimization of logistics processes had a significant social impact, resulting in a more agile and personalized service that strengthens business relationships and contributes to customer loyalty. By prioritizing innovation, the company positions itself as a catalyst for change in the industry, promoting sustainable and socially responsible practices that benefit both its communities and the environment. This transformation included training and staff development, providing employees with the necessary conditions to acquire new knowledge and skills, which, in turn, will contribute to the advancement of their professional careers.

The work offers several significant contributions to management models and professional practices, promoting the development of companies. Its applications are especially relevant in the context of supply chain management, with a focus on the B2B segment. From a managerial perspective, the implementation of the information system enhanced responsiveness in decision-making through the use of reliable data enabling greater control over logistics processes and optimizing resource allocation. The automation of repetitive activities allowed field teams to direct more time and attention to strategic activities, such as customer service and the provision of technical assistance services, reinforcing the relevance of management focused on efficiency and quality and with the organization's strategy to stand out for the products offered and the solution to the customer's needs.

The model built has the potential to be replicated in other regions of the company worldwide or in other companies that operate in a B2B model, seeking to create value through excellence in customer service while exploring efficiency through integrated supply chain management.

Professionally, this solution emphasizes the importance of integrating technology and operational processes, highlighting the role of new digital tools, such as SAP IBP, in driving continuous improvement and competitiveness gains. Companies seeking competitive differentiators in the B2B market can adopt similar approaches, applying integrated systems that optimize the use of working capital, reduce obsolescence costs, and improve inventory management, as evidenced in the study.

From the perspective of the knowledge base, this work contributes to the literature by demonstrating how the Design Science Research methodology, combined with Design Thinking, can be effectively applied to resolve complex problems within an organization. The interventionist and collaborative approach reinforces the value of scientific methods in creating practical management solutions, demonstrating the importance of multidisciplinary integration for innovation in the business environment.

The lessons learned include the need for continuous and personalized adaptation of technologies to meet the specific demands of each company, as well as reinforcing the importance of identifying inefficiencies and acting proactively about them for the success of any digital transformation. These experiences, coupled with the successful implementation of a robust information system, provide a practical guide for other organizations seeking to replicate this success, particularly in global contexts and industries with complex supply chains in the B2B segment.

The implementation project was not without relevant challenges, which reflect the complexity intrinsic to the involvement of various actors in the project. One of the main obstacles was resistance to change, a common phenomenon in organizations that had long operated with traditional processes. This resistance manifested itself at management levels and among the field teams, who feared that the new technology associated with the new process could compromise their roles and responsibilities, thereby affecting customer service. Within the organization, customer service has always been seen as the primary responsibility of Key Account Managers. In addition, the need for employee training and qualification represented an additional barrier, as many professionals had little familiarity with digital tools, requiring considerable effort to ensure that everyone was prepared for the transition.

Integrating different departments, each with its own dynamics and priorities, also proved challenging. Collaboration between sales, logistics, and customer service was essential to the project's success, but it often encountered organizational silos that hindered fluid communication. Managing these interactions requires strong leadership and clear communication to align expectations and ensure the engagement of all stakeholders. Another critical aspect was the need to align existing technologies with the new system, which required a careful analysis of the company's IT infrastructure, as well as technical adjustments that could impact deadlines and costs. These challenges underscore the importance of a strategic and inclusive approach in implementing complex projects, recognizing that success depends on technological solutions and the ability to manage relationships and foster a collaborative environment.

In this context, the importance of leadership as an agent of transformation of realities is highlighted. This work demonstrates that the ability to envision the future and develop a strategic vision, combined with the skills and energy necessary to implement effective changes, are distinctive characteristics of professionals who occupy leadership positions. An effective leader identifies opportunities for innovation, and mobilizes the environment to embrace these changes, creating an environment that favors development, growth, and adaptation.

Ultimately, this research carried out made significant contributions to the business strategy of the Alpha company, highlighting the importance of innovation, integration, and optimization of the supply chain as a tool for value creation for companies operating in the B2B segment.

Author Contributions: Material preparation, data collection, and analysis were performed by F.A.A. The first draft of the manuscript was written by A.C. Review and editing of the manuscript was done by F.A.A., A.C. and L.D.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding

Conflicts of Interest: The authors declare no conflict of interest.

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