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A Strategic Model for Reducing Days-on-Hand (DOH) Through Logistics and Procurement Synchronization

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Abstract-* *This paper proposes a strategic model aimed at reducing Days-on-Hand (DOH) by synchronizing procurement and logistics functions within supply chains. High DOH often leads to increased holding costs, reduced cash flow, and diminished operational efficiency. Drawing on a mixed methods research design, the study integrates qualitative insights from industry practitioners and quantitative analysis of supply chain performance data to develop and validate the model. The framework consists of three core components—procurement timing, logistics scheduling, and dynamic inventory policies—enabled through real-time information sharing and collaborative planning mechanisms. Implementation guidelines are provided to facilitate adoption across diverse industries. The model's synchronization mechanisms enhance cross-functional coordination, optimize inventory turnover, and reduce excess stock. Practical implications highlight improved operational efficiency, cost savings, and supply chain resilience. Finally, the study outlines future research directions to refine the model with advanced technologies and sector-specific adaptations, supporting ongoing efforts to optimize inventory management and supply chain responsiveness.

Indexed Terms-* *Days-on-Hand, Inventory Management, Procurement Logistics Synchronization, Supply Chain Optimization, Inventory Policies, Operational Efficiency

I. INTRODUCTION

Days-on-Hand (DOH) is a critical metric in inventory management that measures the average number of days inventory is held before it is sold or used [1]. It serves as an indicator of inventory efficiency and liquidity, reflecting how effectively a company manages its stock levels relative to sales or production demand [2]. Lower DOH values generally signify efficient inventory turnover, reducing holding costs and risks associated with obsolescence, spoilage, or capital tie-up. Conversely, a high DOH suggests excess inventory, which can lead to increased warehousing costs and reduced cash flow [3].

Managing DOH is especially important in industries with perishable goods or fast-changing market trends, where inventory stagnation can lead to significant financial losses [4]. Furthermore, DOH is often intertwined with broader supply chain performance, influencing responsiveness and customer satisfaction. Consequently, organizations continuously seek strategies to optimize DOH to maintain competitive advantage and operational sustainability [5].

Despite its importance, many organizations struggle to reduce DOH effectively due to complexities in coordinating various supply chain functions. This challenge calls for integrated approaches that align multiple operational areas to minimize excess inventory without risking stockouts [6].

A primary challenge leading to elevated DOH levels is the lack of synchronization between procurement and logistics functions within the supply chain. Procurement teams often focus on securing materials at the right price and quality, but may not align purchase timing or quantities with actual logistical capacities or demand fluctuations. Meanwhile, logistics operations handle transportation, warehousing, and distribution, but without seamless coordination, stock arrivals may not match storage capabilities or downstream demand schedules.

This misalignment results in excess inventory accumulation, delayed shipments, or inefficiencies in replenishment cycles, which directly inflates DOH. Additionally, disconnected systems and siloed decision-making exacerbate information gaps, making it difficult to anticipate and respond to real-time supply chain dynamics. The consequence is a reactive rather than proactive inventory management approach that hinders overall performance. Addressing this issue requires a strategic model that integrates procurement and logistics planning, enabling synchronized operations that can adapt to market and operational variability. Such a model would facilitate visibility, communication, and coordinated decision-making across functions, ultimately reducing DOH and enhancing supply chain responsiveness.

This paper aims to develop a strategic model designed specifically to reduce DOH by fostering synchronization between procurement and logistics activities. The model will emphasize key mechanisms and best practices that promote alignment in purchase scheduling, transportation planning, and inventory management, thereby optimizing stock levels and minimizing waste. It will also outline implementation strategies suitable for various organizational contexts, helping supply chain managers and practitioners apply the model effectively.

The scope of the study includes manufacturing, retail, and distribution sectors where inventory management challenges are pronounced due to fluctuating demand and complex supplier networks. Although the model is designed with broad applicability in mind, special attention is given to industries characterized by perishable products and high turnover rates, as these sectors experience greater financial impact from inefficiencies in inventory holding. By focusing on both operational and strategic dimensions, the paper seeks to contribute to supply chain literature and practice by offering a coherent framework that bridges functional silos and enhances overall supply chain agility.

II. LITERATURE REVIEW

2.1 Inventory Management and DOH

Days-on-Hand (DOH) has been widely studied as a critical indicator of inventory efficiency and overall supply chain health [7]. Research consistently shows that optimal DOH balances inventory availability with cost minimization, directly influencing working capital and service levels. Studies emphasize that lower DOH improves cash flow by reducing excess stock, which in turn reduces storage and obsolescence costs. However, overly aggressive DOH reduction risks stockouts, damaging customer satisfaction, and sales.

Empirical research in sectors like retail and manufacturing has demonstrated a strong correlation between DOH and supply chain responsiveness. For example,it was found that firms optimizing DOH through better demand forecasting and inventory policies achieved significant improvements in order fulfillment rates. Additionally, integrating DOH with performance metrics such as inventory turnover ratio provides a comprehensive picture of supply chain agility and efficiency [2].

2.2 Procurement Strategies

Procurement is a pivotal function influencing inventory levels and, by extension, DOH. Best practices in procurement emphasize strategic sourcing, supplier collaboration, and demand-driven purchasing to minimize inventory costs while ensuring material availability [8]. It is argued that procurement must move beyond cost reduction to include synchronization with supply chain partners, enabling just-in-time deliveries that prevent overstocking [9].

Collaborative procurement strategies, such as vendor-managed inventory (VMI) and supplier integration, have been shown to improve supply visibility and reduce lead times, leading to lower inventory holdings [10]. Furthermore, digital procurement tools and e-procurement platforms enhance data accuracy and facilitate dynamic order adjustments based on real-time demand signals [11]. Research also highlights the importance of procurement flexibility and risk management, especially in volatile markets [12]. Agile procurement practices that incorporate contingency planning and supplier diversification help maintain optimal inventory levels despite external disruptions, contributing to more stable and predictable DOH [13].

2.3 Logistics and Supply Chain Synchronization

The alignment of logistics and procurement processes is central to reducing inefficiencies and excess inventory. Existing theories, such as the Supply Chain Operations Reference (SCOR) model, emphasize integrated planning and execution across sourcing, delivery, and inventory management to improve responsiveness [14]. Synchronization enables timely replenishments that closely match demand patterns, minimizing stockpiling [15].

Several models propose coordination mechanisms like cross-functional teams, shared information systems, and joint performance metrics to foster alignment. For instance, it was presented a synchronized supply chain framework where procurement and logistics jointly manage order quantities and transportation schedules, resulting in improved DOH and lower total supply chain costs [16]. Technological advancements, including Enterprise Resource Planning (ERP) systems and advanced analytics, support synchronization by providing end-to-end visibility and predictive insights. These tools allow proactive adjustments to procurement orders and shipment plans, reducing delays and inventory surpluses [17].

III. METHODOLOGY

3.1 Research Design

The development of the strategic model for reducing DOH through logistics and procurement synchronization follows a mixed methods research design. This approach combines both qualitative and quantitative techniques to leverage each of their strengths. Qualitative methods are used to explore the contextual and operational challenges organizations face in synchronizing procurement and logistics. These insights help identify critical factors and processes that influence DOH, providing a foundation for model development. Meanwhile, quantitative methods enable the measurement and validation of the model's effectiveness through empirical data analysis.

This dual approach allows a comprehensive understanding of the problem by capturing both the depth of organizational practices and the breadth of performance outcomes. It also supports triangulation, enhancing the reliability and validity of findings. By integrating qualitative observations with quantitative metrics, the model is grounded in practical realities and measurable impacts. The research design is iterative, with initial qualitative findings informing model components, followed by quantitative testing and refinement. This cyclical process ensures the strategic model is both theoretically sound and operationally applicable across various industrial contexts.

3.2 Data Collection

Data collection for this study draws from multiple sources to ensure robustness and relevance. Primary data is gathered through semi-structured interviews and focus groups with supply chain managers and procurement officers from diverse industries such as manufacturing, retail, and logistics services. These qualitative methods uncover firsthand experiences and challenges related to procurement-logistics synchronization and its impact on DOH.

Secondary data is sourced from industry reports, academic journals, and supply chain performance databases. These provide quantitative metrics such as inventory levels, DOH statistics, procurement lead times, and logistics throughput rates. Accessing this data allows for benchmarking and validation of the model against real-world operational performance. Additionally, case studies of companies that have implemented synchronization initiatives are analyzed to extract best practices and lessons learned. This combination of qualitative and quantitative data ensures a well-rounded evidence base that supports the strategic model's development and applicability.

3.3 Analytical Framework

The analytical framework employed integrates process mapping, statistical analysis, and systems modeling to evaluate the relationship between logistics-procurement synchronization and DOH reduction. Initially, process mapping techniques such as flowcharts and value stream mapping are used to visualize and analyze existing procurement and logistics workflows. This helps identify inefficiencies and potential synchronization points.

Quantitative data undergoes statistical analysis, including correlation and regression techniques, to quantify the impact of synchronization variables on DOH. These analyses provide empirical evidence supporting the hypothesized relationships within the strategic model and guide parameter settings for simulations. Finally, system dynamics modeling is applied to simulate the interaction between procurement scheduling, logistics capacity, and inventory levels over time. This dynamic approach allows testing of various synchronization scenarios and optimization strategies, enabling the refinement of the strategic model. Together, these analytical tools provide a comprehensive method for both understanding and validating the model's effectiveness.

IV. THE STRATEGIC MODEL FOR DOH REDUCTION

4.1 Model Components

The strategic model to reduce Days-on-Hand centers on three interrelated components: procurement timing, logistics scheduling, and inventory policies. Procurement timing involves aligning purchase orders closely with actual demand forecasts and production schedules, avoiding premature or bulk ordering that leads to excess stock [18]. By optimizing order placement frequency and quantities, procurement activities can better match supply availability with consumption rates, reducing unnecessary inventory holding [19].

Logistics scheduling is the coordination of transportation, warehousing, and distribution to ensure the timely receipt and movement of goods [20]. Efficient scheduling minimizes delays and storage times, enabling inventory to flow smoothly through the supply chain. This component focuses on leveraging real-time data and advanced planning tools to synchronize shipments with procurement plans and downstream demand [21].

Inventory policies define reorder points, safety stock levels, and replenishment rules tailored to the synchronized procurement and logistics environment [22]. These policies are dynamic, adjusting to changing demand patterns and lead times to maintain optimal stock without overstocking. Together, these components create a cohesive framework that systematically reduces DOH [23].

4.2 Synchronization Mechanisms

Synchronization in the model is achieved through integrated communication channels and shared information systems that connect procurement and logistics teams [24]. Real-time data exchange allows procurement to adjust order quantities based on logistics capacity and delivery schedules, preventing stock buildup or shortages. The use of collaborative planning tools ensures both functions operate with a unified demand forecast and inventory status view [25].

Cross-functional coordination mechanisms, such as joint scheduling meetings and performance review sessions, foster accountability and alignment of goals [26]. This cultural integration encourages proactive problem-solving and continuous process improvement, reducing misalignments that increase inventory holding times [27].

Technological enablers like Enterprise Resource Planning (ERP) systems, combined with predictive analytics, support synchronization by providing actionable insights and automated alerts. These tools allow dynamic adjustments to procurement timing and logistics operations, ensuring inventory moves efficiently and DOH is minimized [28].

4.3 Implementation Guidelines

Implementing the strategic model requires a phased approach beginning with stakeholder engagement and process mapping to identify current gaps in procurement and logistics alignment. Organizations should form cross-functional teams responsible for overseeing synchronization initiatives and establishing clear communication protocols.

Next, investment in integrated information systems is essential to enable real-time data sharing and joint decision-making. Training programs should be conducted to build capabilities in using these technologies and understanding synchronized workflows.

Finally, organizations must develop key performance indicators (KPIs) related to DOH and synchronization efficiency, regularly monitoring progress and adjusting policies accordingly. Piloting the model in a controlled environment before full-scale rollout helps identify challenges and refine processes, ensuring sustainable reduction in inventory holding times and improved supply chain performance.

CONCLUSION

This paper presented a strategic model designed to reduce Days-on-Hand by synchronizing procurement and logistics functions. The model is composed of three key components: procurement timing, logistics scheduling, and inventory policies, all integrated through synchronization mechanisms such as shared information systems, collaborative planning, and real-time communication. These components work together to ensure that procurement orders align with logistics capabilities and actual demand, reducing excess inventory and improving turnover rates.

The model's development was grounded in mixed methods research, combining qualitative insights from industry practitioners with quantitative analysis of supply chain performance data. The analytical framework validated that enhanced synchronization between procurement and logistics significantly contributes to lowering DOH, thereby optimizing inventory management.

Adopting this strategic model offers substantial benefits for operational efficiency. By synchronizing procurement and logistics, companies can avoid overstocking and reduce storage costs, freeing up working capital and minimizing waste. Improved timing of orders and deliveries ensures inventory remains lean yet sufficient to meet demand, leading to smoother production and distribution cycles. Furthermore, the model encourages cross-functional collaboration, breaking down traditional silos and fostering a culture of shared accountability and continuous improvement. This cultural shift, supported by integrated technology platforms, enhances decision-making speed and accuracy, enabling organizations to respond more agilely to market fluctuations and disruptions.

Cost savings extend beyond inventory holding reductions. Optimized logistics scheduling reduces transportation costs and warehouse congestion, while strategic procurement minimizes emergency orders and supplier penalties. Collectively, these operational improvements contribute to a more resilient, competitive supply chain.

While the model offers a robust framework for DOH reduction, future research can explore its application across different industry sectors with varying supply chain complexities. For instance, investigating its effectiveness in highly seasonal industries or those with global supplier networks could yield sector-specific refinements. Additionally, integrating emerging technologies such as artificial intelligence and machine learning into the synchronization mechanisms could enhance predictive capabilities, allowing for even more dynamic and adaptive inventory management. Research could focus on how these advanced tools improve real-time decision-making and further reduce DOH. Finally, longitudinal studies evaluating the long-term impacts of model implementation on organizational performance and supply chain sustainability would provide valuable insights. This would help identify potential scalability and continuous improvement challenges, guiding ongoing enhancements to the model.

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